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ABSTRACT

The Mulligan Stew television series on nutritional principles for elementary school students was evaluated using a systems model. The study included student responses in eight schools and evaluation of responses from nutrition specialists, information specialists, television station personnel, and teachers. Agricultural college information specialists gave the most optimistic responses, and the most accurate estimates of audience reaction came from television station personnel. The greatest knowledge gain came in schools that used video tapes and in-class exercises together. Learning appeared to be a consequence of organized concentration on the concepts in a school setting. Further, this concentration was an outcome of an organized system that produced and delivered the series as a package to broadcast stations and schools. The results of this study generally support a systems model of information control for evaluating educational television programs. (CH)

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A SYSTEMS EVALUATION OF A PURPOSIVE MESSAGE:

The "Mulligan Stew" ETV Project *

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A SYSTEMS EVALUATION OF A PURPOSIVE MESSAGE:

The "Mulligan Stew" ETV Project

"Mulligan Stew" is a series of six half-hour color television films on nutrition for 9 to 11-year-olds.[1/] It represents one of the most concentrated professional efforts ever committed to a mass media project on a single topic by the U.S. Department of Agriculture's Federal Extension Service. To a considerable extent, the series is a national experiment, tied in with a larger effort, the Expanded Food and Nutrition Program of the Federal Extension Service and Cooperative State Extension Services.

The Mulligan Stew series was produced in 1971 and 1972 by a group of professional broadcast, film, and other media specialists in the USDA, in consultation with program and nutritional specialists there and at Iowa State University. Supporting educational and promotional materials were developed at Michigan State University.

Formally, the principle stated objective of the series initially was to assist young people in acquiring and applying nutritional principles for healthful, productive individual development.[2/] This and related objectives were to be met through scheduling of the series on commercial and educational television stations. Group enrollment through 4-H clubs or schools would be encouraged, although the series was generally expected to be so attractive that it would, presumably, have some impact even without integration in school or 4-H club programs.

In general, however, the emphasis with Mulligan Stew was on integration. The supporting educational materials include a comic book version of the six films, a guidebook of group exercises for teachers or leaders, promotional posters, and a song book with musical scores and lyrics for the tunes in the films. Promotion and distribution involved several groups and agencies.

They included nutrition specialists and 4-H program specialists of state University staffs, county extension personnel, television station program directors, local 4-H leaders, and elementary school teachers. Program outcomes, then, would clearly depend upon a complex pattern of interrelationships among key groups, which may be viewed for evaluative purposes as distinct but interdependent subsystems.

A systems evaluation approach

The literature on directed social change emphasizes, repeatedly, the importance of the total social context in which such change occurs.[3/] Success of any purposive program for modifying levels of information, attitudes or behavior--however specific these goals may be--is highly dependent upon the integrated way in which the program is developed, perceived, and delivered by the various interacting and interdependent groups and agencies. Such a macro, or holistic, systems perspective is especially important in programmatic evaluation of purposive educational programs that include mass media, educational agencies, and audiences or clientele as distinct but interlocking subsystems.[4/]

For the Mulligan Stew series, the systems evaluation model concentrates on (a) evaluations of the film and expectations of audience group reaction by the various prior subsystems, (b) institutional circumstances under which the program was delivered to the audience, (c) measured reaction of the audience group.

The merit in this approach is in its analytical potential. By studying the structural context in which the program is developed, integrated and delivered, one is better able to identify factors that might assist in understanding and/or predicting outcomes of such programs in the future. This

approach is offered as an alternative to the more traditional evaluational approach which focuses largely on behavioral modification of the audience group alone, particularly as such modification relates directly to message characteristics and to variable characteristics of that audience group. 5/

Through an encompassing structural model, one can deal with individual reaction as related to the larger setting of which the program is a part. Structural analysis allows, for example, analysis of the degree to which systemic factors and individual characteristics should be viewed separately or jointly as determinants of outcomes.

Social systems theory is based on the principle of social roles and functional differentiation of these roles. A social system is a pattern of interacting and interdependent roles, and the total system may be seen as containing a variety of distinct but functionally interdependent subsystems. 6/ A systems analysis of a communication process would require identification of those roles and role relationships concerned with generation, dissemination, reception and feedback concerning the messages in question. Specific configurations of such roles in mass media program evaluation ordinarily include source, channel and source subsystems.

Further subdivisions of these principal subsystems might also be made in a specific case. The source subsystem might, as an illustration, contain distinct disciplinary groupings for separate analysis, such as economists, geographers and soils specialists in the case of a program on land-use planning education. Program production and delivery might consist of further subgroups such as those in materials production, sponsoring agencies, community program agencies, and mass media firms such as newspapers or television stations.

Specification of subsystems, while varying according to the particular communication process under analysis, is according to function rather than

along agency or organizational lines. A mass media subsystem, for example, may be viewed in terms of the roles in several different agencies or firms. Source specialists may be in different collegiate units, governmental institutions, or both. On the other hand, source specialists (such as economists) and channel specialists (such as audio-visual experts) within the same agency may be treated as differing subsystems on the basis of their distinct although highly interdependent functions. The audience (or clientele) subsystem is then seen as also interdependent with the other subsystems and as existing in a particular total social system.

Identification of these interdependent subsystems is central to an analysis of information control processes which may in turn determine various outcomes of an educational program. In any communication process, certain subsystems have the power to make decisions about generation and dissemination or withholding of information. While such controls may be exerted by individual subsystems, they may also be joint or reciprocal decisions. As in any systems perspective, multiple and reciprocal causation is central. For example, an opinion stated about a prospective film by a source group may, when communicated to audio-visual experts, lead to a response that may in turn affect the opinions of the economists.

A systems analysis also involves, as part of the specification of subsystems and their interdependencies, an identification of sources of tension and conflict. Differences and disagreements between source and sponsoring agencies, for example, may themselves have fundamental consequences for program outcomes. Furthermore, tension by itself is not necessarily either negative or positive. Conflict may be functional for system maintenance, for goal attainment, or for adaptive adjustment in the total system. While some types of conflict may lead to barriers in the process under some conditions, there

are other conditions in which conflict may be a stimulator of creativity and a road to better communication. Systems analysis requires a specification of how tension functions in a particular situation.

Mulligan Stew: Scenario and Symbols

While Mulligan Stew was partly an experiment, it was also produced in the firm expectation that such a series would meet the approval of commercial stations, schools, 4-H leaders, parents and children. Briefly, the series is based on a neighborhood group of five youngsters, between 9 and 12 years old and varying in ethnic background. Cast as the "Mulligan Stew gang" in a modified adventure-comedy format, these youngsters in each film deal with and solve a "nutritional problem," by applying knowledge of nutritional principles. These problems include a sleepy and undernourished town, a pair of students whose improper eating habits have led to sluggishness and poor grades, invasion of a neighborhood by a malevolent food faddist, and an overweight race car driver who loses his driving job until the gang gets him to change his eating habits and slim down. The films employ a variety of dramatic and cinematic techniques, including catchy songs and jingles, mostly original, designed to emphasize certain nutritional principles such as the "4-4-3-2" balanced diet concept.[7/] Another is animation, through Sesame Street-type puppets and cartoon characters who sing, state, or spell out rules of good eating and good health.

Symbolic representations and character roles in the series are clearly calculated to appeal to dominant values of American society. The films emphasize, repeatedly, such virtues as good health, physical fitness, clean living, school achievement, active participation in athletics, respect for institutions, and moral and substantive support of others in time of need.

Symbolic portrayals are in line with mass media content and popular behavior modes of the time of the filming (1972), as illustrated by the generally urban setting, informal attire, hair styles and verbal styles of the young (and quite professional) actors. These values and symbols are both popular and largely middle-class, in spite of frequent settings in what appear to be deprived urban neighborhoods. The 4-H club symbol appears frequently.

The series makes liberal use of both positive and negative social models. On the positive side are frequent testimonials from such figures as athletic stars and astronauts concerning the value of good nutrition. On the negative side, the film employs some cultural dualisms, such as the portrayal of the "Flim Flam Man," an actor in his late twenties with wide-brimmed leather hat, beads, dark glasses and a conspiratorial way of promoting "miracle foods" among unsuspecting children that is faintly reminiscent of the junkie stereotype. The "Flim Flam Man" is so similar in many ways to characters on well-known television commercials that he could easily be viewed positively by a young audience, were he not shown in juxtaposition with another character displaying values which are presented as obviously more acceptable. Social failings of the "Flim Flam Man" are underscored by the fact that, physically robust as he appears initially, he is solidly trounced in several athletic contests by Wilbur Dooright, a neurotic, good-natured, but otherwise comical and hapless adult with good intentions who has one overriding virtue--good eating habits and a pedagogical commitment to sound nutritional principles. The message is abundantly clear: miracle foods and food fads do not pay.

Series distribution

The Mulligan Stew series was released for national use in an atmosphere of optimism and high promise. Initial reaction from a few TV stations using

the series was reported to be highly favorable, and program personnel generally expected high use of the series and related materials by schools. These expectations, at least in Minnesota, were initially borne out. In 1973-74, 2,546 schools in the state requested materials for more than 100,000 students, mostly in grades 4, 5 and 6. About 325 group requests came from 4-H clubs and other organizations. While distribution varied from state to state, the pattern in Minnesota was fairly typical. Through contacts between information program personnel and television stations, the series was scheduled on 6 commercial TV channels and 4 educational channels for a six-week period in October and November of 1973. County extension agents and home economists distributed promotional materials to elementary schools who, if they chose to participate, ordered project materials for individual students directly from the Extension Service at the University of Minnesota in St. Paul. These materials were closely tied to the series, so that after the first film ("The Great Nutrition Turn-On") was aired, for example, the teachers could select from specific exercises linked to the themes in the film. Similarly, students could read a comic book version of the same film. They could sing, or hear on records, the songs of the film.

Subsystems and the Evaluational Model

A fundamental assumption of the evaluational model is that actors in various roles, in the total system, perform communicative acts according to perceived expectations and actions of other segments in the system. In this case, a principal concern is the audience orientation of subsystems which include:

1) Nutritional research and extension specialists, as part of the original source group that provided and legitimized the content of the film and related materials;

2) State 4-H information specialists who organized the promotion and scheduling of the series with TV stations;

3) Commercial and educational television station staffs who previewed and scheduled the series for specific broadcasting time;

4) Teaching staffs in the individual schools who, separately or collectively, decided how and to what extent the show series and related materials would be fit into the teaching schedules for individual classrooms.

Other patterns of use were possible. Local 4-H club leaders, if they wished, could have organized group discussions in conjunction with the Mulligan Stew series. Since, however, the predominant pattern in Minnesota involved cooperation with elementary schools, the evaluation model concentrated on that pattern.

The evaluational model, then, concentrates on (a) evaluations of the film and expectations of reaction in audience groups by the various prior subsystems, (b) institutional circumstances under which the program was delivered to the audience, and (c) measured reaction by the audience group. The evaluation is guided by these central hypotheses:

> 1. Among various non-audience subsystems, those most closely associated with the original sponsoring agency will tend to have the highest level of expectations of audience response, compared with subsystems more closely associated with the client audience.

In the case of the Mulligan Stew program, this means that nutrition specialists and 4-H information specialists would tend to have higher levels of expectations than either commercial TV representatives or teacher groups. One reason is that evaluations of these groups are presumably influenced both by the general definition of the program institutionally and by the fact that evaluative judgments for the nutritionists and information representatives necessarily depends more on generalized perceptions of audience behavior than

on knowledge of a specific group. Also, professional associations of agricultural college nutritionists had legitimized the series, a factor which could presumably influence the judgments of individual nutritionists themselves.

Television station representatives presumably have more specific knowledge of the audience and elementary school teachers would be expected to have the most specific knowledge of the particular age group in the study.

> 2. The closer a non-audience subsystem is to the audience subsystem in the information delivery chain, the more accurate the perceptions of audience reaction and behavior will be.

Operationally, this hypothesis leads to the expectation that teachers would tend to have the most accurate perceptions of 9 to 12-year-old reaction to the Mulligan Stew films, given their specialized training and daily contact with this age group. In addition, teachers as part of specific institutions are in a position to control certain aspects of audience reaction through classroom organization and procedure. One would expect more accurate perceptions of such reaction from commercial TV station programmers than from 4-H information specialists, given the specific knowledge that stations have of how audiences respond to varying types of content. This prediction should hold in spite of the fact that 4-H information specialists, as well as TV station personnel, may have specialized professional training in audience analysis. The station professional deals with a wide range of broadcast content and, because of this location in the system, has a better basis for comparative judgments about the audience than the professional at the University would be expected to have.

> 3. Audience reaction will be positively related to perceptual and control factors in the final delivery subsystem. More specifically:
>
> > 3a. The higher the level of expected performance among purposive communicators in contact with the audience, the higher the level of performance which will occur within that audience.

3b. The more extensive the control over the message environment in which the purposive message is presented, the higher the level of performance within that audience.

Operationally, 3a means that student learning and behavioral change, following exposure to the Mulligan Stew series, will be higher in cases where teachers expect higher levels of performance. This is based on the assumption that the generalized definition of the message in the delivery subsystem is fundamental to learning itself. The point is made frequently that teacher and program administrator attitudes may be a factor in performance of children exposed to instructional television.[8/]

The second part of the hypothesis, 3b, indicates that learning and behavioral change are expected to be higher to the extent that schools and teachers control attention to the content through use of associated project materials and re-running the taped shows in the school. Such control of attention should occur in at least two ways. First, it should increase the direct reinforcement which the individual receives for learning the content itself. Secondly, such control should increase the likelihood that the youngster will view the series at home and talk about it outside the classroom situation. In spite of the high use of attention-getting devises in the films, one would nevertheless expect a higher level of attention to the series where it is integrated in school programs, compared with where it is not so integrated. In areas where the series is competing "on its own" with the full range of alternatives for young people on television, one might expect relatively low levels of self-exposure.

Research procedures

This evaluational study was designed as a field experiment, within the systems model outlined above. The systems included:

1. Nutritional research specialists. Although the ideal application of the systems model would include the nutrition specialists who consulted with the producers of the Mulligan Stew series, cost and time considerations precluded contacting them. To represent this specialty, perceptions of the series were measured among 37 nutrition research faculty members in 8 mid-western Universities, all of whom were familiar with the series and had viewed at least two of the films.

2. 4-H information specialists. Each state University Extension Service has at least one staff member who is responsible for coordinating and distributing educational broadcast materials relevant to 4-H programs. Eight such individuals in 8 different states (the same ones represented by the nutrition specialists) were identified and included in the study. Each has specialized training and experience in the educational television area, and each was specifically responsible for liaison with TV stations concerning the Mulligan Stew series. Several of these specialists had consulted directly with the USDA film production group that made the films.

3. Television station representatives. A total of 11 television program directors in 6 commercial and 4 educational stations in Minnesota and adjoining states were included as representatives of the channel subsystem. All of these program directors had seen or previewed at least two of the six films in the series, and six had viewed three films or more.

4. Classroom teachers. A total of 17 classroom teachers in schools where the Mulligan Stew series was shown were questioned about their perceptions of the film and about related project activities in the classes. A limitation of the procedure is that these measures among teachers were conducted after the series was shown. This procedure was necessary, since the teachers had no opportunity to preview the shows before the series began, and

time considerations made it impossible to arrange special previewing by the teachers in advance. The teachers were asked to fill out the questionnaires while post-test measures were being administered in their classrooms.

5. Schools and student groups. This portion of the evaluational study was a modified experimental model, with before and after measurement. The cooperating schools were selected during September, 1973, after the Mulligan Stew series was already scheduled on stations around the state. Since it was clear that schools, and classes within schools, might use the supporting materials at varying levels and in varying levels, this variation was taken into account in choosing schools for study. Schools were chosen where some in-school integration was planned, including videotaping of the films themselves for playback in school and varying use of supporting project materials. At least two levels of control were considered necessary, given the variation that would occur in the "experimental," or "high use" schools.

Eight schools--treated as six population groups for measurement and analysis purposes--cooperated in the study. All except one are in Minnesota.

School A served as a before-after control with no Mulligan Stew films available in any form. This school was chosen in another Midwestern state, where the Mulligan stew films were not being broadcast and none of the supporting materials were used in classrooms during the study period.

School B was a before-after control where the film series was being broadcast, but where no supporting materials or in-class viewing were used. School B is actually two nearby schools in the same district; a media coordinator for the district arranged for their cooperation as a control.

School C was an after-only control where the Mulligan Stew series was broadcast and where some supporting material (but no videotapes and very little in-class viewing) was in use. Like School B, School C is actually two separate

but nearby elementary schools in a single district, which were treated as a single unit because of similarity in situation and program circumstances. The purpose of School C is to conduct a partial check on "Hawthorne" effects, or the possibility that observed results may be a result of the experimental situation.[9/]

Schools D, E, and F were all "experimental" schools where the series was being broadcast, shows were videotaped (black and white) for subsequent class use, and supporting materials and exercises were used. In view of the short period between initiation of the study and the pre-tests before the first broadcast, it was not possible to specify detailed use patterns. Instead, these three schools were chosen in the expectation that use of in-class viewing and supporting materials would vary. This expectation was borne out. School F had the highest overall use of supporting materials and School E was quite similar. Serendipity, a contributing factor in much research, occurred in this project with beneficial results. It occurred in School D, where the videotape equipment broke down after the first program. Teachers there had some difficulty rearranging schedules to view the series on an afternoon educational television program. As a result, School D had a lower level of viewing than E or F and teachers used fewer supporting materials. These circumstances led to substantial difference between overall use levels in School D, compared with E and F, a difference upon which the study capitalized for evaluative purposes. For analysis, School D is referred to as a "moderate use" school, and E and F are termed "high use" schools.

Schools B through F are all in an area where the series was broadcast at 8 a.m. every Saturday, October 6 through November 11, 1973. This showing competed directly with the standard Saturday morning television cartoon programs. The series was also shown at 6:30 p.m. Thursdays and at 2:30 p.m.

Monday afternoon on an educational television channel during succeeding weeks. That is, a person hypothetically could have viewed the program at home on Saturday morning, the following Thursday evening and again the following Monday afternoon, presumably in class. School D scheduled a few Monday afternoon viewings, following the videotape failure, and school B and C had such viewing of two programs in one room of each school.

Pre-tests in schools were all completed on or before Friday, October 5 and post-tests were administered between November 13 and December 15, after the final showing of the series in all time slots.

The student phase of the evaluation study may be summarized schematically as in Figure 1.

FIGURE 1

Field Experimental Design of Student Phase of Study

	Schools					
	A (N:190)	B (N:148)	C (N:171)	D (N:143)	E (N:140)	F (N:214)
Pre-Test	Yes	Yes	No	Yes	Yes	Yes
Mulligan Stew broadcast	No	Yes	Yes	Yes	Yes	Yes
Mulligan Stew video-tapes in classroom	No	No	No	Partial	Yes	Yes
Supporting materials, exercises	No	No	Yes, low	Yes, mod-erate	Yes, High	Yes, High
Post-test	Yes	Yes	Yes	Yes	Yes	Yes
Designation	Field Control	Broad-cast only control	After-only control, low use	Moder-ate use	High use	High use

The study included the 4th, 5th, and 6th grade children in the schools. In all schools except C, the number of cases is based on those who completed both the pre-test and the post-test.

Pre-test and post-test measures were conducted in the classrooms by the group questionnaire method. Questionnaires, printed in large primer type, were distributed to the students by a project staff member, who then led the students through the instrument item by item. Each item was read aloud, including the response alternatives, with enough time provided so that all students completed a given item before any went to the next one. In all cases, it was possible to complete the questionnaire within a single hour. Teachers were present, but did not take part in administration of the test. During the post-test, teachers were asked to fill out their own questionnaires while the students were being tested. (See appendix D)

Specific measures in the student questionnaire included:

1. Nutritional knowledge. Three subsets of items, including combinations of true-false, multiple-choice and fill-in items, were used. The items were adapted partly from a nutritional test in an earlier study, modified so as to reflect the specific content emphasis of the Mulligan Stew series itself.[10/] These subsets included 8 items on nutrients, 9 items on the balanced diet concept, and 2 on digestion processes. Typical items in each subset are:

a) Nutrient knowledge

"The most important vitamin for healthy skin and good eyesight is: (check one)

___ Vitamin A ___Vitamin C ___Vitamin B ___Vitamin D

b) Balanced diet knowledge

"Pick the best breakfast."

___Toast, cereal, sweet roll
___Toast, peanut butter, milk, orange
___Juice, oranges, apple, milk

c) Digestion process

"The esophagus carries food from the mouth to the stomach."

True or False?

Totals for both the subsets and the total test, based on total numbers of correct answers, were used in the analysis. Complete questionnaires are in Appendices B and C.

2. Nutritional behavior. Students were asked to report, in detail, the foods and numbers of servings of each, which they had consumed during the previous day. For this measure, the student filled out a "food inventory" sheet for each meal, with food categories illustrated by line drawings, also adapted from the earlier study cited above. Students were asked to indicate whether they had eaten a particular food, and the number of servings they had, for both meals and snacks. As a result, an exhaustive count of total food intake was recorded for each child for each day. This inventory then made it possible to analyze each child's diet for the whole day according to whether the "4-4-3-2" requirements for a balanced diet had been met.

3. Perceptual measures. Students were queried on several dimensions of reaction to the Mulligan Stew series, including:

a) Perceived social familiarity, defined operationally as the extent to which respondents stated that the visual and verbal cues in the film are similar to their own life styles;

b) Perceived relevant social behavior, defined as the extent to which the respondents state that they view the acts as desirable to imitate;

c) Actor evaluation, or the extent to which the film actors are judged positively on such characteristics as sincerity, modernity, naturalness, interest, maturity, and believability;

d) Institutional cue evaluation, or the extent to which viewers perceive certain institutional portrayals in the film, (such as policemen, baseball players, astronauts, and school environments) as enhancing their interest in the films; and

e) Direct evaluation, in terms of perceived interest of self and friends, in the film.

Estimates of responses to these items, among 9 to 12-year-olds as a group, were made by members of all other responding groups, including teachers, 4-H information specialists, TV station representatives, and nutrition specialists.

Characteristics of school groups

School groups selected for the study vary on certain characteristics (Table 1). Three schools stand out as more highly rural-farm. They are Schools A, D, and F, which are the "full control," the "moderate use" schools and a "high use" school, respectively, with more than two-fifths of the children living in farm homes in each case. Also, Schools A and F have the lowest proportions of students from professional-managerial families and the children in all three come from larger families, compared with the other three.

School "B," the before-after control where the Mulligan Stew series was available on TV stations, is in an outlying suburban-rural area near a metropolitan center. It has the highest proportion (58.9 percent) of non-rural children and the highest proportion (47.5 percent) of children from professional or managerial homes. Next to School B, the least rural school is E (another "high use" school) where under a fourth of the children are from farm homes and nearly a third have parents in professional or managerial occupations. The after-only school, C, tends to be intermediate on most of these characteristics.

Membership in 4-H clubs is highest in school A, which is highly rural, and lowest in B, which is also least rural. Among the other four schools, however, 4-H membership does not vary directly with proportion of children in farm homes. The second highest overall 4-H membership is in School E, which has the second lowest farm residence level.

In summary, two of the control groups are quite different in terms of farm-nonfarm and occupational composition. However, there is similar, although less extreme, variation among the schools where the series was used with in-school support.

The farm-nonfarm differences among the schools are reflected to some extent in type of TV set ownership (Table 2). That is, Schools A, D, and F, which are highest in farm residence, are also highest in proportion having only black and white television sets in their homes. Also, the rural-suburban school, B, has the highest overall proportion of color set ownership, with School E quite similar. Only four children in the entire study, all in "use" schools, reported no working television sets in their homes at the time of the pre-test.

Self-estimates of television viewing vary somewhat from school to school, with a range of 41.4 percent in F to 54.6 percent in A indicating that they watch television "about the same amount" as others their own age. Reports of actual time spent viewing television vary little, across schools, and the variation that does occur is not related to farm-nonfarm characteristics or to color set ownership. Both the lowest and the highest week-day viewing reported by children are in schools with high farm residence, A and F. Except for school A, the typical 4th, 5th, or 6th grade child in this study reported watching television more than five hours each weekday. Averages for Saturday viewing were six hours or more per person for each school. These weekday

levels of viewing are comparable to those reported by Greenberg and Dervin for low and medium income white children in grades 4 and 5.[11/]

Findings: Mulligan Stew Series Viewing

Reports of actual viewing of the individual Mulligan Stew films indicate the sharp differences between schools in the different conditions. (Table 3) In School B, the before-after control with commercial viewing available but no in-school support, nearly two-thirds failed to watch a single film in the series and none in that school watched all six. In School C, the after-only school with some teacher support but no in-school videotapes, slightly more than half saw at least one film but fewer than 2 percent saw the entire series.

Among the "high-use" schools, there was variation in number of programs actually seen. In School F, 87.9 percent reported seeing all six films, with the remainder reflecting, for the most part, absenteeism at various times during the study period. In School E, only 55.7 percent saw all six, a fact largely accounted for by the fact that the 4th film in the series was, for schedule reasons, not shown in all rooms. In School D, equipment problems led to no videotaping after the first program and partial in-class viewing of later programs on the ETV station. As a result, viewing at that school fell-off and less than 10 percent of these children saw five of the films or more.

The data in Table 3 suggest some frustration among children who are urged by teachers to view films, but do not have televised or taped presentations in school. Students were asked: "Were there times when you wanted to watch Mulligan Stew but couldn't because someone wanted to watch something else?" In both of the high-use schools and in the before-after control, roughly a

fourth said "yes." In Schools C and D, however, the figures were 47.7 percent and 37.7 percent, respectively. School C, again, had no videotapes at all and D had in-class viewing for some but not all of the shows. These data point up the difficulty in getting universal participation in ETV viewing at home through school encouragement. Even if children are motivated to take part, situational and family circumstances, such as competing program choices from others, may lead to frustration. In none of the schools did more than 40 percent of the students report viewing the series at home.

Findings: Evaluations by professional groups

Teachers, information specialists, nutritionists and TV program directors were asked to estimate reactions of 9 to 12-year-olds to the series on several dimensions. These estimates may then be compared with the distribution of responses in the five schools, among children who saw at least one film in the series (Table 4). The data may be viewed in terms of the first general hypothesis, which is:

> Non-audience subsystems closely associated with the original sponsoring agency will tend to have higher levels of expectations of audience response than subsystems more closely associated with the client audience.

Data relevant to this hypothesis are based on items concerning interest in the Mulligan Stew series, expected peer group interest, and identification with activities, clothes, hair styles and verbal styles among the actors. The items were worded so as to elicit direct evaluations from the school students. For the non-audience groups, the items were worded in terms of how respondents would expect 9 to 12-year-olds to react (Table 4).

Findings in Table 4 are partially consistent with the first general hypothesis, in the sense that the 4-H information specialists made the most

optimistic estimates, among all non-audience groups, of audience reaction. As a group, the information specialists are identified closely with the USDA film program unit that produced the series and have a vested interest in the project. These eight specialists know each other well through professional organizations, regional agricultural college contacts and information materials exchange programs. They were all aware that the Mulligan Stew series was being produced and some were members of two advisory groups consulting with the USDA program unit.

After the information specialists, the nutritionists would be next most closely identified with the sponsoring agency, although as subject matter specialists, their role is different. Some of these specialists were involved in production of some of the supporting materials and the entire project was widely known in agricultural college extension and research units. There were, however, known to be differing professional views on what nutritional content should be contained in such a series. Six of the 37 nutritionists queried in this study, for example, identified specific content in the films which in their judgment was partially or entirely inaccurate.

Contrary to expectations, the nutritionists tended to give far more conservative estimates of student reaction than 4-H information specialists did. On the question of whether the shows would make young people like 4-H better, the nutritionists were most conservative of all four groups.

Teachers were less optimistic than information specialists on all items, but tended to be more optimistic than the nutritionists. On one key item, however, the teachers were the least optimistic. That item (first one in Table 4) is the one estimating overall interest in comparison with other TV programs which children usually watch.

Television station personnel, in most cases, give estimates which are less optimistic than those of teachers or information specialists. In fact, the difference in estimates between TV station personnel and the information specialists is rather striking in view of the fact that both groups are presumably trained in and oriented toward visual communication. Their different communication roles in the entire process would seem to be principal factors explaining these factors. The station personnel are quite autonomous from the Land-Grant university structure that produced and distributed the films and, while presumably interested in the public service aspects of the project, have less of a vested interest in the success of these films as such. They are also, as indicated above, in a better position than information specialists to compare the films with what they may already know about audience reaction to similar content.

The second general hypothesis, for which Table 4 data are also relevant, is that:

> Non-audience subsystems closer to the audience subsystem in the information delivery chain will be more accurate in perceptions of audience reaction than subsystems which are farther removed from that audience.

Estimates of student reaction are consistent with this proposition in the sense that teachers and television station personnel tend to make more accurate estimates than 4-H information specialists do. On the other hand, the nutritionists, presumably farther removed from the young population in this sequence, are nevertheless close to student estimates. They are the closest group on items 2 and 4 and are next to the closest on 1, 5, and 7.

By averaging the absolute discrepancies between ratings across the 7 items, it is possible to make an overall comparison of accuracy in estimating student reactions, as in the bottom line of Table 4. Overall, the television

station personnel make the most accurate estimates, followed by the nutritionists, teachers, and information specialists, in that order. Information specialists and teachers tend to overestimate student reaction more than nutritionists tend to do.

These findings may be viewed in the light of previous findings on source and channel estimates of audience reaction. Tannenbaum, for example, found that scientists in some cases may predict reader values about science news more accurately than editors do.[12] Similarly, a group of photography professionals were less accurate than source specialists in estimating audience evaluations of interest in an earlier Minnesota study.[13, 14]

In the current study, a sharp line may be drawn between media personnel and the information specialists who, in this case, make quite different estimates which may well reflect their differing location in the entire system.

Other data produce similar results. Students were asked to rate the Mulligan Stew actors on 13 dichotomous criteria, based on polar adjectives. Again, the other four groups made estimates of how young people would make these ratings. As in the other case, the most accurate estimates of audience reaction came from the television station personnel (Table 5), and the nutritionists were the next most accurate.

There was one case in which station personnel estimates were the most inaccurate of all four groups. This discrepancy occurred in estimates of whether Wilbur Dooright, the warm but hapless adult character in the film, made the series more or less interesting (Table 6). The television station representatives were least likely to expect that Dooright would make the shows "more interesting" for the young audience (27.3 percent, compared with 72 percent or higher for four or five schools). In this one case, the information

specialists were as accurate in their estimates as the nutritionists.

The reason for the television station representatives' relatively low expectations in this case are not clear. The "Wilbur Dooright" character was played by a highly experienced professional actor, whose comical ineptness combined with good intentions resembled the antics of a number of television actors known to be popular with young audiences. While the station representatives might have simply regarded this character as inane, one would then wonder why the nutritionists (two of whom objected to Dooright as ridiculing adults and the teacher role) didn't come to a similar conclusion. This finding is of some importance since the series made heavy use of Dooright both as an appeal mechanism and as a vehicle for conveying and reinforcing nutritional principles.

Within the schools, the data make it quite clear that evaluation by itself is not necessarily related to total school effort put into the entire project. On every rating in tables 4, 5 and 6, the highest rating is in School D, where there was a videotape break-down and only partial in-school viewing. Second highest evaluation is in C, where videotapes were not used at all. Ratings in E and F, the high use schools, tend to be only slightly higher than in B, where no in-school support occurred and where viewing levels were the lowest.

Of particular practical and theoretical significance is the fact that evaluations were so high in School D even after the videotape failure, and in spite of some child frustration in not being able to view more of the programs. It appears that attitudes toward such a project may be largely an outcome of the definition given to it initially by the entire school organization. Initial enthusiasm among teachers and other staff in School D was extremely high; classroom walls were heavily adorned with Mulligan Stew

posters throughout the study period. Even though equipment problems occurred, the children appear to have reacted as though they were missing something good, without displacing their frustration on film content itself. Similarly, in the School C group, administrator-teachers appeared highly favorable toward the films in spite of lower in-school support than in E or F. Again, such initial institutional support may well be transferred to the student population.

In the School B group, teachers by agreement with the research staff generally refrained from discussing the Mulligan Stew series or its content in any way. In such an absence of institutional support, even students who saw some programs were either relatively uninterested or openly hostile to the films.

Behavioral change among students

Two principal dimensions of nutritional behavior among students were measured among students. These were reports of eating a balanced diet, as determined from an analysis of actual foods reported eaten in the previous day, and participation in family meal planning decisions.

Behavioral change on eating a balanced diet, is generally higher where in-school viewing and support of the program occurred (Table 7). The "balanced diet" data also indicate rather sharp variation among schools and underscore the importance of before-after measures on such a variable. The highest levels of "balanced diet" eating, according to the "4-4-3-2" criterion, is in School A, the highly rural area where 4-H membership was highest of all schools.

In the post-test, all three schools with in-school support showed an increase in balanced diet eating, at levels reaching or approaching

statistical significance (.05 level) in the two high-use schools. Both the full control and the school without in-school support showed nonsignificant declines in balanced diet eating at pre-test time.

On the other measure, participation in meal planning, there were no significant changes between pre-test and post-test for any of the schools.

Sensitization effects and the after-only control

One of the inherent potential consequences of any experimental design is a "sensitization" effect of the experimental situation, generally referred to in the literature as a "Hawthorne" effect. In this study, the participants may be alerted, by the pre-test, to the content of the subsequent messages and "put two and two together." To the extent that such sensitization effects occur, the change scores may be attributable, at least in part, to an "interaction" effect between the experimental message and the pre-test. Such a consequence cannot be identified with a before-after control alone, since it is the combined presence of pre-test and message that provides the conditions. 15/

To check for the presence of such a possible sensitization effect, School C served as an after-only methodological control. However, videotapes were not used in School C, only one teacher scheduled viewing of two programs on the ETV channel, few in-school exercises were used, and overall viewing of the series was considerably lower than in D, E, and F, as indicated in Table 3 above. The value of School C data for after-only control purposes is therefore limited. Nevertheless, some evidence concerning the sensitization question may be gained by comparing post-test scores according to level of film viewing, as in Table 8.

While School C post-test scores are lower at both moderate and high viewing levels than in E and F, the most relevant comparison is with D, where

only the first part of the series was videotaped and where fewer in-school exercises were used. School C and D students who viewed three programs or more (much of which was necessarily at home in both cases) had similar post-test scores. Among those who saw 1 or 2 of the films, however, there is a sharp difference. In School D, the low viewers actually had higher scores than those that viewed three or more. There is no apparent explanation for that particular finding. However, it should also be pointed out that in School D, viewing is not the same as in C, since in-school viewing (videotape or educational channel) was arranged for roughly half of the series in School D, and D also had higher uses of exercises. Finally, there were two classes in School D where teachers used 4 exercises in support of the film series. These two classes may be compared directly with a single class in C in which the teacher also used 4 exercises. The change score for that one class in C (with "change" based on an estimate of before-film scores taken from the average of other groups) and the average change for the two comparable classes in D are exactly the same--3.4. Therefore, however inherent "Hawthorne" or "sensitization" effects may be in experimental designs generally, they do not appear to be a major factor in these findings. Also consistent with this conclusion is the fact that School B, like School A, showed no overall increase in knowledge scores between the pre-test and the post-test, in spite of the fact that a third of the School B students saw at least one film in the series.

Knowledge change on different topics

As indicated above, nutritional knowledge in three areas--balanced diet, nutrient characteristics, and digestion process--was measured in the tests. While data for individual items are enumerated in Appendix A, certain overall

summary points may be made about the pattern of knowledge change that occurred, as illustrated in Table 9.

First, there is clearly a dramatic change in knowledge of the 4-4-3-2 "balanced diet" idea in schools D,E and F. In none of these schools were more than 2.8 percent able to state the number of servings required daily for each of the four food groups before seeing the films. Afterwards, correct answers were given by about 73 percent or more in the same schools. In the full and partial control schools, A and B, there were fewer than 3 percentage points difference between before and after measurements.

Also, changes were more likely to occur on the balanced diet concept than on nutrient knowledge or digestive processes. The low change on nutrient items may relate directly to the greater complexity of the nutrient concept and presentation techniques that could have left students in doubt. For example, one question was "Which one is a nutrient--protein, energy, or meat?" In none of the schools was there a significant increase in the percent picking "protein," which varied between a low of 41.8 percent and 53.5 percent in all schools and tests. There was another nutrient item which brought fewer correct responses in the post-test in high-use schools, suggesting a slight boomerang effect. The question was: "Which food contains the most protein--milk, carrots, juice, or cereal?" While the correct response is "milk," the proportion making that choice declined and the proportion selecting "carrots" increased in Schools D, E and F. This anomaly may result from the fact that the films frequently stressed eating fresh carrots and other snack foods, citing vitamin content and mentioning the fact that some snacks do contain some protein. Although the films never described carrots as a high protein food, the frequent mentions and illustrations of carrots may have increased the saliency of that particular food.

One other type of item showed little or no change regardless of condition: knowledge about what constitutes a "full serving" of food. Roughly half of all students in all schools correctly identified an 8-ounce glass as a full serving of milk in both pre-test and post-test. A similar item on servings also showed little variation among schools and no significant change. This finding may be surprising in view of the heavy stress on the "4-4-3-2" concept of diet balancing, which is based directly on counting of servings, and the fact that "serving" was defined several times in each film.

Overall change scores (Table 9) also show a marked growth in knowledge in Schools D, E, and F, in comparison with A and B. The change is 3.89 points for D, 5.21 for E and 5.54 for F. The school differences in change scores are statistically significant beyond the .001 level. Furthermore, a two-way analysis of variance for Schools D, E, and F indicates that school differences in these three alone are also significant beyond the .01 level, whereas differences according to grade (4th, 5th or 6th) are not significant.

Estimates of knowledge gain by the four non-student groups were based, not on expectations for each item, but on relative learning expected from differing content areas. That is, each group was asked to rank five principles according to how well they would expect these principles to be learned by 9 to 11-year-olds. The principles ranked included balanced diet concept, carbohydrates and fats, vitamin D, definition of a serving of milk and the fact that iron and iodine are mineral nutrients.

All four specialist groups ranked the balanced diet concept as the most likely one to be learned, and all except the information specialists ranked the vitamin principle (part of the nutrient set of items) as least likely to be learned. Furthermore, the definition of a serving was rated no higher than a third by all four groups.

In a general sense, all groups accurately expected the balanced diet concept to be most readily learned. In fact, when asked what the main point of the series was, the most common response from all groups was either diet balancing in general or the 4-4-3-2 idea in particular. In a general sense, then, the students tended to gain most on precisely that part of the content that the other subsystems most expected to produce learning.

Knowledge change and knowledge control

The third general guiding hypothesis for this evaluational study states that audience reaction will be directly related to perceptual and control factors in the final delivery subsystem. Specifically, the hypothesis has two parts:

3a. The higher the level of expected performance among purposive communicators in contact with the audience, the higher the level of performance which will occur within that audience.

3b. The more extensive the control over the message environment in which the purposive message is presented, the higher the level of performance within that audience.

In terms of social theory, hypothesis 3a rests on the principle of the self-fulfilling prophecy: to the extent that actors in a social situation define circumstances in a certain way, their actions and consequent succeeding events in the social situation tend to make those definitions true. In the case of the Mulligan Stew film, one would predict that teachers, who are in a position to control a major share of attention and behavior of students, would act in terms of their expectations. Several experimental studies in recent years by Rosenthal, Baratz and Hall support the conclusion that teacher expectations can be a significant determinant of pupil responses.[16/] Such an outcome is not necessarily a result of teacher acts alone, but would also relate to the fact that students tend to defer to the authority of the teacher

in the classroom. To fulfill their own expectations of the role of the good student, young people would seek to determine teacher expectations and then act accordingly.

On the Mulligan Stew analysis, teacher expectations may be a necessary but not sufficient condition for knowledge gain, while overt control in the classroom is the key factor. Operationally, the tests of 3a rests on the teachers' expectations of performance, in terms of both attitudinal and behavioral response from students. The data provide little support for 3a, and then only in terms of teacher expectations of recall. The rank correlation between teacher recall estimates and class group knowledge gain, across 14 class groups in schools using videotapes and exercises is .39, nonsignificant statistically. Teacher expectations of student attitudes toward the films, by and large, show no relationship with knowledge gain. Across schools, teachers varied little in their estimates of student interest in the program, and in their estimates of understandability of the film series.

In the case of 3b, however, the data provide strong support for the control hypothesis. The number of nutritional exercises used along with the film, the core of teacher participation in the program, is the most powerful predictor of knowledge change across the 14 class groups (Table 10). The rank correlation between the two measures is .82 ($p < .01$). When data from the after-only control, School C, are included, (with change estimated from pre-test averages of other schools) the rank correlation rises to .90. Finally, including class groups from both School B and School C brings the correlation to .93.

As far as level of learning is concerned, then, teacher-student interaction is a predominant factor. Use of in-class nutritional exercises is actually a stronger predictor of knowledge gain than is median number of

Mulligan Stew programs seen by the class group (Table 11). The rank correlation between median number of programs viewed by the class and class knowledge gain is .65; the rank correlation between exercises and viewing by class is .71, suggesting that teacher concentration in the class is a basic factor in controlling attention to the content and retention of the concepts.

Importance of such direct control may be highlighted by also considering the fact that, as indicated above, student expression of interest in the series was not highest in the schools that had the highest viewing or the highest gain scores. The highest interest was expressed in School D, which had less in-school control and was lower than both E and F in knowledge gain.

Furthermore, individual reactions to the series were generally unrelated to performance within a given school (Table 12). The measured level of interest in the program, and the evaluations of Mulligan Stew actors were almost entirely unrelated to knowledge change scores for individuals. There is a tendency, in schools D and F, for knowledge gain to be negatively related to evaluation of actors in the kind of television programs which the child says he or she usually watches. That is, in school F for example, the less favorable the child's rating of such television actors in the usual programs, the more that child learned from the Mulligan Stew series. Considering the low level of these correlations and the fact that they are not uniform across schools, however, such a relationship should be considered largely speculative.

Parental occupation is generally unrelated to change in knowledge. The effect of age varies, reaching a high of -.23 in School E and also tending in a negative direction (-.11) in School F. In both cases, there was a tendency for older children, that is, 6th graders, to learn less. At least two 6th grade teachers in these schools in effect predicted that such might occur; both offered the observation, at the end of their questionnaire, that in their

judgment the content was more appropriate for grades lower than the one they taught.

Change scores in all three schools, D, E and F, were unrelated to sex or to place of residence--whether the youngster lived on a farm, in a rural nonfarm home, or in town.

Exercises vs. Films

The strong relationship between knowledge change and use of nutritional exercises in class, compared with the somewhat weaker relationship between learning and class level of viewing, might suggest that learning resulted more from the exercises than from the films. Such a conclusion however, would be misleading. It is neither the exercises nor the films, alone or together, that produced the change. It is both, in the institutional context, that led to the observed outcomes. In the systems perspective, intra-subsystem factors provide controlling conditions.

Initially, development of the film series led to widespread use of the entire nutritional project materials in the schools. Existence of the series and a school-wide decision to use the videotapes is clearly a fundamental intra-system factor in stimulating teacher use of associated materials. Except for School B, where there was an explicit agreement with the research staff not to use in-class exercises, schools made their own decisions about whether to use in-class materials and to what degree. While one should be cautious in generalizing from single cases, School C (actually two similar schools) had no videotape equipment and also used very few in-class exercises, even though the materials had been requested by the teachers at the beginning of the school year. In School D, the program began in an atmosphere of high teacher interest; yet, after the videotape failure and subsequent difficulties

in scheduling viewing in class educational channel broadcasts, class use of materials by teachers trailed off. Thus, both viewing and class exercise use was lower in D at the end, indicating that the highest level of intra-system enthusiasm may not produce intended results in the absence of resources and organizational support.

Also, there is some evidence in the study about class instruction without the series. In School A, the full control school, the 5th grade teacher reported giving about 33 hours of general nutrition instruction during the study period--although this general instruction did not include the Mulligan Stew project materials themselves. Yet, that class did not show a knowledge gain; instead, there was a slight (nonsignificant) decline.

Mulligan Stew and Knowledge Control

A fundamental outcome of this study is its support of a general model of information and knowledge control.[17/] To the extent that knowledge is produced, packaged, and delivered through institutions that are mutually reinforcing and in control of audience attention and expectations, there is a greater likelihood of learning and behavioral change.

This experience with Mulligan Stew illustrates the importance of control in the schools. But school control may be only one possibility; it illustrates the principle of organizational control at the audience subsystem level as a necessary condition for learning. School control, however, is not necessarily the only institutional means of meeting this condition; 4-H club organizations or other parent-youth groups might well be able to provide functionally equivalent organized attention.

The combination of media and school control was crucial in this particular study. Extensive availability of such content in the mass media channels alone

does not appear to meet the conditions necessary for the intended result. As data from schools without videotapes indicate, teacher encouragement to view at home tends to produce student frustration in families that are either undisposed or unable to reinforce the teacher suggestions.

If educational material of this type is to achieve intended results, there must be reinforcement at the point of delivery. But it appears that the family as a subsystem may be unequipped to provide such control and reinforcement. In a cafeteria of popular programs, Mulligan Stew "on its own" could hardly compete. Where it was available at three times during the week on two broadcast channels, measured knowledge did not increase at all unless there was at least some input from the schools themselves. Such control and reinforcement factors clearly outweigh attitudinal reactions to the films among individual students, and they also seem to outweigh such factors as family occupation and place of residence. If student attitudes are a factor, it appears that such attitudes themselves may be shaped by what happens in the school. In School B, for example, where there was no class discussion of the project, reactions even among those who watched some of the series at home were far less favorable than in any of the other schools.

Responses of the other groups may be seen in a systems perspective in terms of their predictive value, as contrasted with their controlling impact on final outcomes. Given the key location of information specialists in the organizational network distributing the series, their high estimates most likely indicate an early and deep commitment to the entire project. From an analytical perspective, these responses may predict more about the use of the program in the total system than they do about ultimate audience response. Most accurate from a predictive point of view are the television station representatives' estimates, at least for young people who in fact see the

series. But for actual viewing and learning, organized and controlled attention is the key. The high level of energy devoted to developing and distributing the materials may be seen as meeting necessary conditions for getting them into the broadcast and educational subsystems in the first place. Institutional control at the point of delivery provides the final conditions for meeting formal program objectives. For the entire process to achieve its intended result, it appears that a systems perspective must be internalized within the key subsystems themselves.

While the legitimizing importance of the nutritional specialists' evaluations was acknowledged earlier, the predictive accuracy of this subsystem should not be overlooked. In several studies, scientists or subject-matter specialists have demonstrated an ability to predict audience response at levels either comparable or superior to mass media specialists. In the case of Mulligan Stew, nutritionists as a whole provided a better indicator of how young people would evaluate the series than information program specialists did. Nutritionists were about as accurate in such estimates as were television station personnel and teachers. One might speculate that such predictive accuracy among specialists relates to the fact that graduate training and professional experience in a specialty requires a commitment to teaching and, therefore, an orientation toward empathy with audiences.

Finally, the results suggest the importance in future applications of this model of seeking estimates, not only of ultimate audience response, but of reaction of subsystems farther along in the delivery chain. For early analysis, nutritionist and information personnel estimates of teacher and station response would have been enlightening, since these two latter groups jointly determine whether the audience is brought into contact with the message

content or not. To the extent that such judgments are reliable in a given system, the value of early estimates by information professionals and source professionals can be assessed more extensively and more accurately.

Summary

The "Mulligan Stew" television series on nutritional principles for 9 to 12-year-olds was evaluated within the perspective of a systems model. The study included student response in eight schools and estimates of such response from nutrition specialists, information specialists, television station personnel, and teachers.

Among the estimates of audience evaluation, the most optimistic were made by agricultural college information specialists, who have key positions in the network for distribution of the series to stations for scheduling and broadcast. The most accurate estimates of audience reaction, overall, were made by television station personnel. Next most accurate were nutrition specialists and teachers, in that order.

In terms of final outcome, the results generally support a systems model of information control. The factor most closely and immediately related to knowledge gain is organized input at the school and classroom level. Schools that used videotapes were most likely to use in-class exercises, and the level of use of these exercises was closely related to knowledge change. The rank correlation between use of exercises and knowledge change in 14 class groups is .82 ($p < .05$). However, in schools in the same area where the series was available in three different time slots but where no classroom exercises were used, there was no measurable gain in level of nutritional knowledge.

Characteristics of individual students within schools were largely unrelated to level of learning; the more fundamental finding is that learning

is a consequence of organized concentration on the content in the institutional setting. This concentration, in turn, is an outcome of a highly developed and organized system that produced the series and ultimately delivered it, as a package, to broadcast stations and schools. In this context, performance estimates of other subsystems should be analyzed in terms of both their predictive value and their controlling influence on final outcomes.

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TABLE 1

Characteristics of students in six schools in Mulligan Stew study

	SCHOOL					
	A (N=190)	B (N=148)	C (N=171)	D (N=143)	E (N=140)	F (N=214)
AGE						
8		2.0	.6	.7		
9	15.3	21.8	25.1	18.2	32.9	20.7
10	34.9	32.7	31.0	31.5	35.0	33.3
11	35.4	32.7	34.5	39.9	21.4	32.4
12	12.2	10.2	8.8	9.8	10.7	12.7
13	2.1	.7				.9
TOTAL	99.9%	100 %	100 %	100.1%	100 %	100 %
4-H						
Yes	31.9	9.9	12.0	17.5	26.3	16.4
No	68.1	90.1	88.0	82.5	73.7	83.6
TOTAL	100 %	100 %	100 %	100 %	100 %	100 %
SEX						
Boy	50.5	55.4	45.6	44.8	55.0	51.9
Girl	49.5	44.6	54.4	55.2	45.0	48.1
TOTAL	100 %	100 %	100 %	100 %	100 %	100 %
BROTHERS & SISTERS						
1 or none	24.3	23.8	20.0	19.7	29.0	17.3
2 or 3	40.2	46.9	53.5	47.9	44.2	38.8
4 or more	35.4	29.2	26.5	32.3	26.8	43.9
TOTAL	99.9%	99.9%	100 %	99.9%	100 %	100 %
RESIDENCE						
Farm	42.5	9.2	27.1	43.6	22.5	49.5
Rural, non-farm	29.6	31.9	45.2	30.0	42.8	18.9
Town	28.0	58.9	27.7	26.4	34.8	31.6
TOTAL	100.1%	100 %	100 %	100 %	100.1%	100 %
OCCUPATION						
Professional, managerial	17.1	47.5	24.2	27.7	30.7	16.0
Clerical, sales	4.1	16.5	3.6	6.4	10.5	7.5
Skilled	14.1	20.1	29.1	20.6	27.2	27.2
Service	7.6	2.9	8.5	9.2	5.3	3.3
Farm	27.6	2.2	10.3	14.2	8.8	25.4
Unskilled	22.4	10.1	23.6	20.6	15.8	19.7
Other (retired)	7.1	.7	.6	1.4	1.8	.9
TOTAL	100 %	100 %	99.9%	100.1%	100.1%	100 %

TABLE 2

Television viewing among 4th, 5th, and 6th grade students in 5 schools.*

	A (N=190)	B (N=148)	D (N=143)	E (N=140)	F (N=214)
TV set availability					
none			.7	.7	.9
color only	18.4	13.5	31.5	20.7	16.8
black/white only	45.3	23.0	31.5	25.7	41.6
color & black/ white	36.3	63.5	36.4	52.9	40.7
TOTAL	100 %	100 %	100.1%	100 %	100 %
Would you say you watch television more or less than others your age?					
more	20.9	25.8	25.6	27.7	28.9
less	24.5	28.3	25.6	26.8	29.6
same as others	54.6	45.8	48.8	45.5	41.4
TOTAL	100 %	99.9%	100 %	100 %	99.9%
Average hours per day spent watching television					
before school	.52	.68	.55	.58	.77
school afternoons	1.12	1.50	2.04	2.12	2.14
school nights	2.80	3.15	2.77	2.95	3.06
TOTAL weekday viewing	4.44	5.33	5.36	5.65	5.97
Saturdays	6.64	6.70	6.10	6.70	6.93

* School C is not included, since these measures were in the pre-test questionnaire which was not administered in School C.

TABLE 3

Viewing of Mulligan Stew series by 5 different schools

	B (N=148)	C (N=169)	D (N=143)	E (N=140)	F (N=214)
Percent who viewed:					
none	63.5	48.5	1.4		
1 show	27.7	26.0	11.9		.5
2 shows	3.4	5.3	18.9	.7	.5
3 shows	3.4	5.9	40.6	2.1	
4 shows	1.3	4.7	17.5	7.1	2.3
5 shows	.7	8.4	4.9	34.3	8.9
6 shows		1.2	4.9	55.7	87.9
TOTAL	100 %	100 %	100.1%	99.9%	100.1%
Percent viewing specific shows					
1. "The Great Nutrition Turn-On" 1st in series	17.9	15.7	94.8	96.4	94.9
2. "Look Inside Yourself" 2nd in series	11.0	25.2	32.4	92.8	97.7
3. "The Film-Flam Man" 3rd in series	4.1	19.5	66.9	95.7	97.7
4. "Getting it all Together" 4th in series	1.4	21.4	59.9	69.1	97.2
5. "Countdown 4-4-3-2" 5th in series	4.1	28.5	20.1	95.7	97.7
6. "Racer That Lost His Edge" 6th in series	5.5	5.3	12.3	92.1	97.2
Percent reporting times when wanted to watch but couldn't	27.8	47.7	37.7	22.9	25.7
When did you watch?					
home only	15.5	33.7	4.9	.7	.9
school only	16.2	10.1	37.1	67.9	46.3
home & school	2.0	4.7	54.6	27.1	52.8
other	2.7	3.0	1.4	2.9	
none above	63.6	48.5	2.0	1.4	
TOTAL	100 %	100 %	100 %	100 %	100 %

TABLE 4

Estimates of Student Evaluations of Mulligan Stew Films, Compared with Actual Ratings of Student Viewers in 5 Schools

	Specialists' Estimates				Schools					
PERCENT WHO:**	Teachers (N=17)	4-H Information Spec. (N=8)	Commercial TV Reps. (N=10)	Nutritionists (N=37)	B (N=55)*	C (N=90)	D (N=143)	E (N=140)	F (N=214)	School Total (N=642)
1. Rate Mulligan Stew as more interesting than other TV programs you usually watch.	11.7	87.5	36.4	16.2	18.2	30.0	47.5	29.3	23.3	30.5
*** Difference	-18.8	+57.0	+ 5.9	-14.3						
2. Think their (children's) closest friend would like the Mulligan Stew TV series.	76.5	87.5	63.6	62.2	30.9	70.0	81.8	50.7	50.5	58.6
*** Difference	+17.9	+28.9	+ 5.0	+ 3.6						
3. Feel the Mulligan Stew TV shows would make young people like 4-H better.	41.2	50.0	36.4	18.9	30.9	30.0	55.2	45.7	39.2	42.2
*** Difference	- 1.0	+ 7.8	- 5.8	-23.3						
4. Did the Mulligan Stew Gang do things that you (9-12 year-olds) like to do yourself? (% yes)	88.2	100.0	63.6	67.6	45.5	74.4	79.0	64.3	70.1	69.3
*** Difference	+18.9	+30.7	- 5.7	- 1.7						
5. Did most of the Mulligan Stew Gang wear the kind of clothes that you like to wear? (% yes)	94.1	100.0	90.9	91.9	56.4	73.3	80.4	72.2	64.5	70.3
*** Difference	+23.8	+29.7	+20.6	+21.6						
6. Did most of the Mulligan Stew Gang have hair styles like young people you know, or not? (% yes)	88.2	100.0	90.9	91.9	56.4	74.4	84.0	70.0	79.9	75.9
*** Difference	+12.3	+24.1	+15.0	+16.0						
7. Did most of the Mulligan Stew Gang talk the way you and your friends do? (% yes)	94.1	100.0	45.4	59.5	41.8	55.6	61.5	48.6	42.1	49.7
*** Difference	+44.4	+50.3	- 4.3	+ 9.8						
****Average of Difference	20.4	32.6	8.9	12.9						

* Number of cases in each school is based on number who viewed one or more Mulligan Stew shows.

** For the four non-student groups, these questions were worded as estimates of how students would respond, for example: "Would you say the Mulligan Stew shows were more interesting, or about as interesting to 9 to 12 year-olds as programs that they usually watch.

*** Average difference between non-student groups and student total proportion.

****Average difference in either direction between non-student groups and overall student proportion.

TABLE 5

Estimates of student ratings of Mulligan Stew Gang members by four groups of Specialists compared with actual ratings of student viewers in 5 schools

	SPECIALISTS' ESTIMATES				SCHOOLS					
	Teachers (N=16)	4-H Information Specialists (N=8)	Commercial TV Reps. (N=10)	Nutrition-ists (N=33)	B (N=53)	C (N=88)	D (N=140)	E (N=140)	F (N=214)	Average of All Schools
Average Rating*	10.5	10.5	9.4	10.2	7.5	10.2	11.2	8.6	9.1	9.5

* The average rating is based on the number of positive responses made in a series of 13 different dichotomous choices, such as boring - not boring, interesting - not interesting, believable - not believable and natural - not natural. The higher the number, then, the more positive the rating.

TABLE 6

Estimates of student evaluations of the "Wilbur Dooright" character by four groups of specialists, compared with actual evaluations by student viewers in 5 schools

Proportion saying Wilbur Dooright made shows:*	SPECIALISTS' ESTIMATES				SCHOOLS				
	Teachers (N=17)	4-H Information Specialists (N=8)	Commercial TV Reps. (N=10)	Nutrition-ists (N=37)	B (N=55)	C (N=90)	D (N=143)	E (N=140)	F (N=214)
more interesting	94.1	75.0	27.3	75.7	40.0	83.3	86.7	72.9	78.5
less interesting			18.2	10.8	21.8	4.5	4.2	15.7	13.6
didn't matter		25.0	45.4	5.4	27.3	8.9	7.7	10.7	7.9
no answer	5.9		9.1	8.1	10.9	3.3	1.4	.7	
TOTAL	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

* For specialist groups, the question was phrased in terms of how 9 to 12-year-olds would be expected to react to the Wilbur Dooright character.

TABLE 7

Proportion of students reporting balanced diets and participation in family meal planning, before and after Mulligan Stew series

	SCHOOLS				
	A	B	D	E	F
Percent reporting eating balanced diet yesterday					
Before	49.7	43.3	30.9	39.6	44.2
After	48.2	32.9	39.6	53.2	55.2
Change	- 1.5	-10.4	+ 8.7	+13.6	+11.0
Percent reporting helping decide "What family is going to have for breakfast, lunch or supper" (quite often or almost all of the time).					
Before	25.8	16.3	22.4	20.0	19.1
After	20.2	15.0	23.4	21.8	20.1
Change	- 5.6	- 1.3	+ 1.0	+ 1.8	+ 1.0

TABLE 8

Post-test total nutritional knowledge scores, according to school and level of viewing of Mulligan Stew ETV series

SCHOOL	Number of Mulligan Stew films viewed			
	None	1 - 2	3 - 4	5 - 6
C (After-only measurement)	8.22 (N=83)	8.95 (N=54)	10.11 (N=18)	11.13 (N=16)
D (Moderate use)	*	12.07 (N=44)	11.72 (N=83)	11.29 (N=14)
E (High use)	*	*	9.23 (N=13)	12.38 (N=126)
F (High use)	*	*	15.0 (N=5)	13.18 (N=207)

* Fewer than 5 cases

TABLE 9

Knowledge of nutritional principles before and after Mulligan Stew series in six schools

		SCHOOLS					
		A (N=190)	B (N=148)	C (N=171)	D (N=143)	E (N=140)	F (N=214)
Nutrient Knowledge							
(Avg.)	Before	3.52	3.20		3.16	2.84	3.03
	After	3.45	3.33	3.39	3.58	3.20	3.50
	Change	- .07	+ .13		+ .42	+ .36	+ .47
Digestion Process							
(Avg.)	Before	1.45	1.15		1.12	1.10	1.03
	After	1.62	1.35	1.22	1.58	1.71	1.83
	Change	+ .17	+ .20		+ .46	+ .61	+ .80
Balanced Diet							
(Avg.)	Before	4.06	3.69		3.43	3.37	3.48
	After	3.38	3.25	4.25	6.41	6.67	6.89
	Change	- .68	- .44		+2.98	+3.30	+3.41
Total Nutritional Knowledge							
(Avg.)	Before	9.27	8.16		7.87	7.11	7.76
	After	8.89	8.21	8.92	11.76	12.32	13.30
	Change	- .38	+ .05		+3.89	+5.21	+5.54
4-4-3-2 Concept (Percent Correct)							
	Before	3.2%	4.7%		2.8%	1.4%	1.4%
	After	5.8%	6.8%	22.2%	72.7%	72.9%	81.7%
	Change	+ 2.6	+ 2.1		+70.9	+71.5	+80.3

TABLE 10

Mulligan Stew Series Availability - Related Classroom Exercises And Total Nutritional Knowledge

SCHOOL	Class	Grade	"N"	Classroom Exercises	Average Knowledge Score Pre	Post	Change Score	Programs Watched
A	A-1	4	56		7.2	7.5	.3	
(Total	A-2	5	68		10.2	9.1	-1.1	
control)	A-3	6	66		10.1	9.8	- .3	
B	B-1	4	26		7.2	7.0	- .2	
(Partial	B-2	4	25		6.4	6.6	.2	
control)	B-3	5	25		8.6	8.4	- .2	1
	B-4	5	24		8.3	9.2	.9	
	B-5	6	24		9.6	10.1	.5	
	B-6	6	24		9.0	8.4	- .6	
C	C-1	4	31	2	7.2	7.8	.6*	
(After-only	C-2	4	30		7.2	7.6	.4	
control)	C-3	5	32		7.7	7.0	- .7	
	C-4	5	20	4	7.7	11.1	3.4	5
	C-5	6	33		8.6	9.8	1.2	
	C-6	6	25	1	8.6	11.5	2.9	2
D	D-1	4	21	7	7.5	11.2	3.7	1
(Moderate	D-2	4	19	4	7.1	9.9	2.8	1
use)	D-3	5	26	8	7.6	10.9	3.3	3
	D-4	5	25	5	7.9	12.4	4.5	2
	D-5	6	29	4	8.0	11.9	3.9	4
	D-6	6	23	5	9.0	13.9	4.9	3
E	E-1	4	32	11	6.8	11.8	5.0	5
(High	E-2	4	30	10	8.0	13.3	5.3	5
use)	E-3	5	27	14	7.6	13.5	5.9	6
	E-4	5	24	11	6.3	12.1	5.8	6
	E-5	6	27	5	7.9	10.8	2.9	6
F	F-1	4	67	8	7.5	13.3	5.8	6
(High	F-2	5	67	8	7.8	12.6	4.8	6
use)	F-3	6	80	15	7.9	13.6	5.7	6

* Since no pre-tests were conducted in School C, change scores for that school are based on estimated pre-test levels, taken as the average pre-test level for all of the other schools in the study.

TABLE 11

Rank Correlation Change, Knowledge Change, and Other Factors of 14 Class Groups

	Knowledge Change	Number of Mulligan Stew Shows Seen	Number of Nutritional Exercises Used in School
Knowledge Change	---	---	---
Number of Mulligan Stew Shows Seen	.65	---	---
Number of Nutritional Exercises in School	.82	.71	---
Teacher's Estimated Recall	.39	.19	.15

TABLE 12

Correlations between nutritional knowledge change scores and selected variables <u>within</u> three schools

Correlation of Knowledge Change Scores with Schools:	D (N=143)	E (N=140)	F (N=214)
Evaluation/Interest Scale	.01	.10	.01
Mulligan Stew Actor Evaluation	-.01	.07	.04
General TV Actor Evaluation	-.13	-.04	-.19
Age	.05	-.23	-.11
Parent's Occupation	.08	-.04	-.04

APPENDIX A

DETAILED RESPONSES

APPENDIX TABLE A-1

Individual Knowledge Test Items: Nutrients

	A (N=190)		B (N=148)		C (N=170)	D (N=143)		E (N=140)		F (N=214)	
	Pre	Post	Pre	Post	Post	Pre	Post	Pre	Post	Pre	Post
Which one is a nutrient?											
Protein	48.2	40.5	50.7	43.9	50.9	52.4	53.5	48.9	54.3	41.8	50.0
Energy	14.8	20.0	14.8	20.3	18.3	17.5	15.5	11.5	16.4	12.7	19.2
Meat	37.0	39.5	34.5	35.8	30.8	30.1	31.0	39.6	29.3	45.5	30.8
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fat is a nutrient that:											
builds muscles	42.9	38.4	31.5	36.5	49.1	49.6	52.8	51.4	40.7	53.7	23.8
builds teeth	3.7	9.5	11.6	12.8	8.3	8.4	8.5	10.0	6.4	4.2	4.2
gives you energy	53.4	52.1	56.9	50.7	42.6	42.0	38.7	38.6	52.9	42.1	72.0
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Bread gives you the same nutrients as cereal.											
True	78.3	82.6	63.3	73.6	82.9	65.0	90.8	64.7	88.6	66.4	96.2
False	21.7	17.4	36.7	26.4	17.1	35.0	9.2	35.3	11.4	33.6	3.8
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
The most important vitamin for healthy skin and good eyesight is:											
Vitamin A	24.4	25.8	28.8	21.6	29.6	30.8	21.8	30.7	13.6	26.2	27.1
Vitamin C	31.2	33.7	39.0	41.2	42.0	39.9	32.4	39.3	49.3	42.5	40.2
Vitamin B	18.5	16.8	13.7	18.2	16.0	9.0	10.6	12.1	15.0	14.0	14.0
Vitamin D	25.9	23.7	18.5	19.0	12.4	20.3	35.2	17.9	22.1	17.3	18.7
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
The best food group for protein is the fruit and vegetable group.											
True	69.1	63.7	73.6	59.9	66.3	79.0	53.5	77.9	49.3	79.9	37.4
False	30.9	36.3	26.4	40.1	33.7	21.0	46.5	22.1	50.7	20.1	62.6
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
An important mineral for strong teeth and bones is:											
Iron	39.7	42.1	46.6	42.6	39.4	46.9	24.5	51.4	32.1	36.9	24.8
Calcium	51.3	47.4	43.2	47.3	45.9	48.2	62.2	32.1	51.4	58.0	60.3
Iodine	6.4	7.9	3.4	5.4	10.0	.7	11.2	5.0	11.4	2.8	10.7
Magnesium	2.6	2.6	6.8	4.7	4.7	4.2	2.1	11.4	5.0	2.3	4.2
TOTAL	100%	100%	100%	100%	100%	100%	100%	99.9%	99.9%	100%	100%
Which food contains the most protein?											
Milk	66.3	58.9	52.0	59.9	58.2	59.9	47.2	51.8	41.4	48.1	26.7
Carrots	14.7	20.0	17.6	16.3	15.9	11.3	31.0	18.7	41.4	13.1	41.1
Juice	11.1	11.6	18.9	13.6	11.8	20.4	12.6	19.4	10.0	19.2	12.6
Cereal	7.9	9.5	11.5	10.2	14.1	8.4	9.2	10.1	7.2	19.6	19.6
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Check everything that is a mineral nutrient.											
Iodine & Calcium	4.8	2.6	.7	.7	2.9		2.0	2.1	2.1	1.4	3.3
Iodine only	.5	.5		.7				.7	1.4	.5	.5
Calcium only		1.1	.7	.7	1.2	.7	.7				
Neither	11.1	24.7	21.6	17.6	16.5	13.3	7.0	20.7	8.6	18.2	11.7
Iodine and other	10.6	7.9	5.4	7.5	9.4	2.8	14.7	7.9	10.0	6.0	11.7
Calcium and other	45.0	31.6	45.9	40.8	40.6	57.3	26.6	35.7	23.6	47.7	23.8
Both and other	28.0	31.6	25.7	32.0	29.4	25.9	49.0	32.9	54.3	26.2	49.0
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

APPENDIX TABLE A-2

Individual Knowledge Test Items: Digestion Process

	A (N=190)		B (N=148)		C (N=170)	D (N=143)		E (N=140)		F (N=214)	
	Pre	Post	Pre	Post	Post	Pre	Post	Pre	Post	Pre	Post
The esophagus carries food from the mouth to the stomach.											
True	79.3	84.2	79.1	78.9	82.2	83.2	95.8	77.9	97.9	58.4	96.7
False	20.7	15.8	20.9	21.1	17.8	16.8	4.2	22.1	2.1	41.6	3.3
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
What does saliva do?											
changes proteins to vitamins	18.5	12.1	34.0	25.9	37.1	43.3	15.4	40.0	14.3	25.7	4.7
stops digestion	13.2	9.5	29.9	15.6	20.6	27.3	21.7	27.1	12.1	29.4	8.4
changes starch to sugar	68.3	78.4	36.1	58.5	42.3	29.4	62.9	32.9	73.6	44.9	86.9
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

APPENDIX TABLE A-3

Individual Knowledge Test Items: Balanced Diet

	A (N=190)		B (N=148)		C (N=170)	D (N=143)		E (N=140)		F (N=214)	
	Pre	Post	Pre	Post	Post	Pre	Post	Pre	Post	Pre	Post
A balanced diet is food from 3 food groups.											
True	59.3	56.8	53.4	56.1	36.5	62.2	18.3	57.9	10.0	60.3	9.3
False	40.7	43.2	46.6	43.9	63.5	37.8	81.7	42.1	90.0	39.7	90.7
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pick the best breakfast.											
Toast, cereal, sweet roll	44.2	43.7	48.0	37.2	36.9	39.8	26.1	45.7	27.9	40.2	25.7
Toast, peanut butter, milk, orange	36.8	44.7	31.8	43.2	42.3	28.7	64.0	35.6	66.4	31.3	64.0
Juice, orange, apple milk	19.0	11.6	20.2	19.6	20.8	31.5	9.9	18.6	5.7	28.5	10.3
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Check the line that lists all 4 food groups.											
Milk, cheese, bread, turkey	10.0	6.8	14.2	11.5	14.7	16.1	7.0	12.2	6.4	16.0	3.8
Grapes, carrot, bread, turkey	8.4	14.2	16.2	19.6	15.9	11.9	11.3	12.9	8.6	16.0	8.5
Milk, carrot, bread, turkey	44.7	56.9	38.5	45.3	55.9	41.9	74.0	41.1	77.9	33.7	83.5
Milk, eggs, bread, turkey	36.9	22.1	31.1	23.6	13.5	30.1	7.7	33.8	7.1	34.3	4.2
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
A serving of milk is:											
a tablespoon	.5	.5	2.0	.7	1.8	.7	.7		.7		.9
an 8 oz. glass	54.0	52.6	55.4	55.3	51.8	52.4	52.4	47.1	56.4	50.5	54.7
half a cup	17.5	6.9	11.5	12.2	14.3	16.8	14.7	19.3	8.6	20.1	14.5
a 12 oz. glass	28.0	40.0	31.1	31.8	32.1	30.1	32.2	33.6	34.3	29.4	29.9
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
A full serving of food.											
correct	34.7	31.1	32.4	37.2	42.4	28.7	35.7	30.7	41.0	34.6	41.2
incorrect	65.3	68.9	67.6	62.8	57.6	71.3	64.3	69.3	59.0	65.4	58.8
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Servings needed per day from each food group.											
Meat Group											
1 serving	21.8	12.6	31.5	23.0	8.3	32.6	2.1	38.2	1.4	32.2	.9
2 servings	52.2	57.5	47.3	46.6	68.0	47.5	83.1	44.1	83.6	51.2	85.8
3 or more	26.0	29.9	21.2	30.4	23.7	19.9	14.8	17.7	15.0	16.6	13.3
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fruit & Vegetable Group											
1 serving (or none)	10.1	8.9	13.7	13.5	13.1	18.4	4.2	22.1	.7	23.2	.5
2 servings	28.2	39.6	40.4	37.8	23.8	42.6	2.1	47.1	4.3	36.5	.5
3 servings	43.1	32.6	32.2	33.8	23.8	31.9	4.2	27.2	3.6	30.8	1.9
4 or more	18.6	18.9	13.7	14.9	39.3	7.1	89.5	3.6	91.4	9.5	97.1
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Milk Group											
1 or none	2.1	5.3	4.8	3.4	3.0	7.8	.7	6.6	1.4	4.7	.9
2 servings	3.2	10.5	15.1	24.5	15.6	11.3	8.5	12.5	7.9	12.3	5.2
3 servings	43.4	33.7	45.9	32.7	49.1	53.2	85.2	50.0	82.1	56.6	91.5
4 servings	42.9	40.5	26.7	27.9	26.3	18.4	5.6	25.0	8.6	13.7	2.4
5 or more	8.4	10.0	7.5	11.5	6.0	9.3		5.9		12.7	
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Bread and Cereal Group											
1 or none	34.9	22.6	45.8	29.7	25.6	48.6	4.9	63.2	1.4	58.5	.9
2 servings	31.7	37.4	29.9	30.4	29.2	26.4	8.5	19.9	10.0	24.1	8.9
3 servings	21.7	29.5	15.3	23.0	12.5	17.1	2.1	13.2	6.4	13.2	1.9
4 or more	11.7	10.5	9.0	16.9	32.7	7.9	84.5	3.7	82.2	4.2	88.3
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Knowledge of Balanced Diet Concepts											
Balanced	3.2	5.8	4.7	6.8	22.2	2.8	72.7	1.4	72.9	1.4	81.7
Deficient in 1 group	19.5	14.2	11.5	13.5	23.4	4.9	19.6	2.9	20.7	7.5	14.5
Deficient in 2 groups	56.2	58.9	39.2	41.1	32.2	50.3	4.9	46.4	3.6	51.0	1.9
Deficient in 3 groups	17.4	17.4	36.5	29.1	16.4	33.6	.7	38.6	1.4	32.2	1.4
Deficient in 4 groups	3.7	3.7	8.1	9.5	5.8	8.4	2.1	10.7	1.4	7.9	.5
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

APPENDIX TABLE A-4

Proportion Reporting Eating Specific Foods Yesterday, According to Meal

	A (N=190)		B (N=148)		C (N=170)	D (N=143)		E (N=140)		F (N=214)	
	Pre	Post	Pre	Post	Post	Pre	Post	Pre	Post	Pre	Post
Breakfast											
Juice	40.5	31.3	43.2	35.8	35.1	23.1	23.8	34.3	30.0	29.0	29.9
Eggs	23.7	14.7	9.5	9.5	12.9	10.5	6.3	12.9	17.9	12.1	13.6
Milk or Cocoa	65.3	61.6	58.1	56.8	52.6	53.8	57.3	50.0	65.0	54.7	69.2
Meat or Fish	8.9	6.8	2.0	4.1	6.4	2.8	4.9	2.9	5.0	3.7	7.9
Sandwich	.5	.5			1.2	.7	1.4	1.4		1.4	1.9
Doughnut	5.3	5.3	3.4	8.8	4.1	5.6	3.5	10.0	6.4	6.5	3.7
Cereal	56.8	57.4	64.9	54.1	57.3	53.8	53.8	61.4	52.1	57.0	57.9
Cake or Cookies	5.3	7.4	2.7	.7	4.7	2.8	2.8	5.7	5.7	2.8	3.7
Koolaid or Pop				.7	1.2		1.4	2.9	1.4	2.3	.9
French toast/waffle	12.6	15.8	8.8	11.5	7.0	7.7	7.0	9.3	9.3	6.1	7.9
Bread/toast/muffins	51.1	40.5	38.5	37.2	48.5	32.9	36.4	42.9	43.6	44.9	42.1
Jelly	9.5	10.0	13.5	8.8	16.4	9.8	7.0	13.6	10.7	10.7	10.3
Peanut butter/nuts	2.6	7.4	7.4	5.4	5.3	4.2	2.8	5.0	5.0	4.7	4.7
Cheese	3.7	1.1	.7	.7	2.3	1.4	2.1	.7	.7	1.9	1.4
Potato chips	1.1	.5	.7			.7		2.1	1.4	.5	
Fruit	22.1	20.0	16.9	12.8	21.6	15.4	19.6	15.0	15.7	12.1	17.3
Candy	3.7	2.6	2.7	1.4	1.8	2.1	.7	5.0	3.6	1.4	2.8
Soup		.5	1.4	.7			.7	.7	.7		.5
Ice Cream											.5
Vegetable or salad	4.2	1.1	1.4	2.0	4.7	1.4	1.4	.7	2.9	2.8	2.8
Pie, tart, pudding	.5		2.7	2.7				.7			.5
Coffee										.5	
Lunch											
Juice	.5	.5	3.4	1.4	5.3	36.4	1.4	.7	1.4	.5	.5
Eggs	1.1	2.1	1.4	.7	5.3	1.4	.7		.7	.5	
Milk or Cocoa	84.7	78.4	76.4	79.7	70.8	75.5	72.7	80.0	87.1	58.4	75.2
Meat or Fish	44.7	38.4	61.5	57.4	45.6	17.5	29.4	47.9	60.0	75.2	66.8
Sandwich	4.2	5.3	6.1	6.1	10.5	5.6	7.7	27.9	5.7	14.0	15.0
Doughnut	3.2	3.2	3.4	.7	6.4	3.5	.7	2.1	2.1	1.9	.9
Cereal	1.1	.5	1.4		.6	1.4		.7	.7		.5
Cake or Cookies	57.9	54.7	31.8	28.4	24.6	23.1	44.8	8.6	9.3	8.9	8.9
Koolaid or Pop	2.1	1.6	2.0	2.0	4.7	3.5	6.3	.7		.5	.5
French toast/waffles	.5	1.1		2.0	4.1	1.4			.7	.9	.5
Bread/toast/muffins	62.1	65.8	61.5	71.6	66.1	67.1	66.4	52.9	66.4	67.3	79.0
Jelly	3.2	3.7	16.2	13.5	5.8	1.4	1.4	2.1		2.3	1.4
Peanut butter/nuts	4.2	28.4	18.2	12.8	9.4	28.7	2.1	2.1	7.1	3.3	6.1
Cheese		2.1	2.7	12.8	7.0	2.8	22.4	17.9	44.3		.9
Potato chips	2.1	4.7	17.6	15.5	10.5	9.8	14.0	9.3	58.6	3.3	7.5
Fruit	37.9	22.1	46.6	42.6	34.5	18.9	23.8	58.6	47.9	48.6	50.0
Candy	6.3	7.4	6.1	9.5	3.5	7.0	7.0	4.3	4.3	3.7	6.1
Soup	2.6	2.6	.7		15.8	1.4	20.3	58.6	.7	.9	.5
Ice Cream	1.6	1.1	.7	33.1	4.1	3.5	1.4	.7	1.4	1.4	.9
Vegetable or salad	46.3	43.2	34.5	33.1	35.7	25.2	24.5	39.3	30.7	53.3	47.7
Hot Dish	4.2	.5	3.4	5.4	5.3	38.5	25.9				.9
Pie, tart, pudding			.7	.7		.7	.7	2.1	2.9	2.8	
Coffee											

APPENDIX TABLE A-5

Proportion Reporting Eating Specific Foods Yesterday, According to Meal

	A (N=190)		B (N=148)		C (N=170)	D (N=143)		E (N=140)		F (N=214)	
	Pre	Post	Pre	Post	Post	Pre	Post	Pre	Post	Pre	Post
Supper											
Juice	5.3	2.6	4.1	1.4	2.9	4.2	3.5	4.3	7.1	4.2	5.1
Eggs	.5	2.6	2.0	3.4	3.5	2.1	2.1	1.4	2.9	2.8	5.6
Milk or Cocoa	65.8	62.6	72.3	72.3	67.3	66.4	74.8	62.1	58.6	59.8	75.2
Meat or Fish	70.5	64.7	68.2	54.1	62.6	60.8	63.6	62.9	60.0	58.4	75.2
Sandwich	3.2	2.6	2.0	2.0	1.2	4.9	.7	2.9	1.4	10.7	4.2
Doughnut	4.7	4.2	2.0	1.4	2.3	3.5	3.5	6.4	9.3	5.6	4.2
Cereal	1.1	.5		.7				1.4		1.9	.9
Cake or Cookies	27.4	33.7	31.1	17.6	19.9	24.5	17.5	22.9	22.9	21.5	29.4
Koolaid or Pop	23.7	6.8	10.1	8.8	6.4	16.1	13.3	15.0	9.3	17.3	8.4
French toast/waffles	2.1	1.1	3.4	2.7	4.7	.7	4.9	2.1	2.9	2.3	4.7
Bread/toast/muffins	48.4	42.6	41.9	42.6	43.3	45.5	41.3	48.6	47.9	38.3	55.1
Jelly	11.1	3.7	2.0	2.7	7.6	4.9	4.2	8.6	5.7	9.8	7.9
Peanut butter/nuts	6.8	5.8	4.1	3.4	1.2	7.7	3.5	4.3	4.3	5.6	8.9
Cheese	13.7	7.4	7.4	8.1	5.8	12.6	8.4	6.4	10.7	7.9	8.4
Potato chips	12.6	13.2	8.8	10.8	5.3	9.1	9.8	11.4	13.6	15.9	10.3
Fruits	21.1	18.4	21.6	16.9	21.1	15.4	21.0	17.9	17.9	21.5	31.8
Candy	7.9	4.2	.7	2.7	.6	6.3	3.5	5.0	3.6	4.2	5.1
Soup	11.6	7.9	8.1	10.1	9.4	9.1	6.3	3.6	11.4	7.9	9.3
Ice Cream	16.3	8.9	8.8	12.8	11.7	11.2	16.1	10.7	12.9	18.7	14.5
Vegetable or salad	54.2	46.8	47.3	37.8	46.8	45.5	45.5	42.9	34.3	52.8	54.2
Hot Dish	8.4	7.4	14.2	12.8	6.4	11.9	8.4	12.1	10.0	10.3	7.0
Pie, tart, pudding	4.2	3.2	2.7	.7	.6	.7	.7	2.1	1.4	3.7	.9
Snacks											
Juice	4.7	9.5	4.7	7.4	7.6	2.1	7.0	5.7	6.4	6.5	5.1
Eggs	.5		.7					.7	.7	.5	
Milk or Cocoa	55.8	47.9	37.2	38.5	44.4	35.0	38.5	60.7	67.9	30.4	31.3
Meat or Fish	3.2	5.8	2.0	4.1	4.1	2.8	2.8	1.4	1.4	1.9	2.3
Sandwich	4.2	2.6	2.7	1.4	4.1	1.4	2.8	10.7	3.6	2.3	1.9
Doughnut	2.6	1.1	2.0	4.7	1.8	1.4	2.8	1.4	2.1	3.3	.9
Cereal	4.7	2.6	.7	5.4	2.3	3.5	4.2	4.3	5.0	5.1	4.2
Cake or Cookies	30.0	37.9	39.2	33.1	34.5	23.8	25.9	23.6	20.7	27.1	27.1
Koolaid or Pop	21.6	18.9	20.3	29.7	19.3	28.0	32.9	23.6	20.0	21.0	17.8
French toast/waffles									.7		.9
Bread/toast/muffins	15.3	15.8	11.5	14.9	19.3	11.2	18.2	16.4	19.3	17.8	20.6
Jelly	.5	1.1	.7		.6	2.1	.7	1.4		.5	1.4
Peanut butter/nuts	1.1	2.6	.7	2.0	.6	3.5	2.8	2.1	5.0	3.3	4.2
Cheese	2.6	2.1	.7	1.4	2.3	1.4	1.4	1.4		1.9	2.3
Potato chips	12.6	16.3	8.8	8.8	11.1	14.0	10.5	11.4	8.6	7.9	8.9
Fruit	19.5	10.5	23.0	15.5	17.0	18.2	16.8	23.6	17.9	15.0	16.8
Candy	18.4	15.8	17.6	18.9	14.0	28.0	20.3	20.0	15.7	26.2	22.0
Soup	1.1	.5		.7		.7		1.4	.7		.5
Ice Cream	17.9	17.4	20.9	17.6	21.1	17.5	16.1	14.3	14.3	18.7	15.0
Vegetable or salad	2.6	2.6	1.4	2.7	2.9	2.8	2.1	2.9		1.9	1.4

APPENDIX TABLE A-6

Summary of Diet Eaten for the Whole Day (Yesterday) According to Major Food Groups

	A (N=190)		B (N=148)		C (N=170)	D (N=143)		E (N=140)		F (N=214)	
	Pre	Post	Pre	Post	Post	Pre	Post	Pre	Post	Pre	Post
Bread & Cereal Group											
None	.6	1.3	.8		1.4		2.5	.8		.5	.5
1		.7	2.3	2.7	1.4	3.6			1.0		1.0
2	4.1	2.0	5.4	4.5	2.9	3.6	5.9	.8	9.4	3.0	3.1
3	7.1	4.7	8.5	6.4	7.9	10.0	9.2	7.6	10.4	3.0	4.7
4	9.4	12.7	14.0	11.8	12.2	7.3	11.8	7.6	7.3	7.9	9.9
5	10.6	10.0	14.0	10.9	12.2	18.2	10.9	11.9	13.5	8.9	14.6
6	12.4	9.3	11.6	13.6	9.4	13.6	10.9	10.2	10.4	11.4	15.6
7	12.4	11.3	7.0	13.6	9.4	9.1	10.1	16.9	9.4	10.9	8.9
8 or more	43.5	48.0	36.4	36.4	43.2	34.5	38.7	44.1	38.5	54.5	41.7
TOTAL	100.1%	100%	100%	99.9%	100%	99.9%	100%	99.9%	99.9%	100.1%	100%
Fruits & Vegetable Group											
None	6.2	8.8	6.3	5.3	8.7	5.0	10.4	1.0	4.0	8.6	1.1
1	5.0	8.8	6.3	10.6	13.5	17.4	11.3	10.7	10.9	7.0	6.6
2	6.2	13.5	15.1	18.6	11.1	15.7	12.2	11.7	13.9	10.8	12.2
3	14.9	8.1	17.5	22.1	11.9	16.5	15.7	19.4	11.9	11.9	16.0
4	16.1	16.9	16.7	13.3	13.5	19.0	14.8	21.4	8.9	14.6	16.0
5	12.4	13.5	9.5	12.4	6.3	5.0	12.2	7.8	12.9	12.4	15.5
6	14.3	8.8	7.1	3.5	7.1	5.0	7.0	7.8	9.9	9.2	9.9
7	8.1	9.5	4.0	3.5	4.0	2.5	1.7	2.9	9.9	5.4	6.6
8 or more	16.8	12.2	17.5	10.6	23.8	14.0	14.8	17.4	17.8	20.0	16.0
TOTAL	100%	100.1%	100%	99.9%	99.9%	100.1%	100.1%	100.1%	100.1%	99.9%	99.9%
Milk Group											
None	.6	.6	1.4	2.3	2.7	.8	2.4			1.6	.5
1	5.5	4.9	5.0	3.8	4.1	8.3	2.4	2.5	2.6	8.3	5.6
2	6.6	9.1	8.5	6.1	7.5	10.6	8.7	9.8	7.0	8.3	7.1
3	8.8	9.8	16.3	7.6	11.6	15.9	7.9	12.3	8.7	18.1	15.7
4	19.9	19.5	17.7	19.1	11.6	16.7	14.3	16.4	13.0	15.5	19.2
5	14.4	25.0	18.4	13.0	10.9	12.1	20.6	19.7	19.1	16.1	16.2
6	14.9	9.8	13.5	14.5	15.6	13.6	11.9	13.1	13.9	10.9	11.6
7	9.9	11.6	5.7	12.2	6.8	9.1	11.9	8.2	3.5	4.1	8.6
8 or more	19.3	9.8	13.5	21.4	29.3	12.9	19.8	18.0	32.2	17.1	15.6
TOTAL	99.9%	100.1%	100%	100%	100.1%	100%	99.9%	100%	100%	100%	100.1%
Meat Group											
None	6.3	2.2	2.9	2.8	9.0	5.3	12.1	8.9	4.1	3.1	3.0
1	18.2	11.7	9.5	16.0	12.0	16.8	11.2	21.0	7.1	9.8	5.6
2	21.6	19.7	32.1	39.6	24.8	23.0	24.1	29.0	28.6	25.3	24.4
3	23.3	28.5	23.4	16.0	22.6	21.2	14.7	16.9	25.5	22.2	26.9
4	13.1	16.1	13.9	12.3	11.3	15.0	19.8	8.9	12.2	20.1	18.8
5	9.7	8.8	9.5	5.7	9.0	8.8	7.8	10.5	11.2	9.8	10.2
6	2.8	5.1	5.1	1.9	3.8	3.5	5.2	2.4	4.1	5.2	5.6
7	2.3	2.9	1.5	1.9	3.0	2.7	1.7		3.1	2.1	3.6
8 or more	2.8	5.1	2.2	3.8	4.5	3.6	3.4	2.4	4.1	2.5	2.0
TOTAL	100.1%	100.1%	100.1%	100%	100%	99.9%	100%	100%	100%	100.1%	100.1%
Diet of the Whole Day											
Balanced	49.7	48.2	43.3	32.9	37.5	30.9	39.6	39.6	53.2	44.2	55.2
Deficient in 1	28.0	35.5	25.8	40.5	38.5	40.4	31.3	37.4	24.1	39.3	28.2
Deficient in 2	16.1	10.0	27.5	20.3	15.6	20.2	20.8	17.6	17.7	12.3	12.9
Deficient in 3	4.9	4.5	3.3	5.1	5.2	5.3	6.3	5.5	3.8	4.3	3.7
Deficient in 4	1.4	1.8		1.3	3.1	3.2	2.1		1.3		
TOTAL	100.1%	100%	99.9%	100.1%	99.9%	100%	100.1%	100.1%	100.1%	100.1%	100%

APPENDIX B

PRE-TEST QUESTIONNAIRE

NAME _____

SCHOOL _____

GRADE _____

TEACHER _____

FOOD,

MEALS

and

TV

1. Which one is a nutrient ? (Check one)

_____ Meat

_____ Energy

_____ Protein

2. True or false ?

A balanced diet is food from 3 food groups.

_____ True

_____ False

3. Fat is a nutrient that (check one)

_____ gives you energy.

_____ builds better teeth.

_____ helps build strong muscles.

4. True or false ?

Bread gives you about the same kind of nutrients as cereal.

_____ True

_____ False

5. True or false ?

The esophagus carries food from the mouth to the stomach .

_____ True

_____ False

6. The most important vitamin for healthy skin and good eyesight is (check one)

_____ Vitamin A

_____ Vitamin C

_____ Vitamin B

_____ Vitamin D

7. True or false ?

The best food group for protein is the fruits and vegetables group.

_____ True

_____ False

8. Pick the best breakfast. (Check one)

____ Toast , cereal and sweet roll

____ Toast , peanut butter , milk and orange

____ Juice , oranges , apple and milk

9. Which one of these things does saliva do? (Check one)

____ Changes protein to vitamin.

____ Stops digestion.

____ Begins to change starch to sugar.

10. The most important mineral for building strong teeth and bones is (check one)

_____ Iron

_____ Calcium

_____ Iodine

_____ Magnesium

In the next three questions, pick the foods for each meal that would make a balanced diet for a whole day.

11. First, check all of the foods that, together, would make a balanced breakfast. Do not check more than 4.

____ Juice	____ Milk
____ Eggs	____ Pancakes
____ Bread	____ Potatoes
____ Coffee	

12. Next, check all of the foods that, together, would make a balanced lunch. Do not check more than 4.

____ Bread and butter	____ Doughnut
____ Banana	____ Boiled eggs
____ Milk	____ Apple
____ Peanuts	____ Cookies

13. Now, check all of the foods that, together, would make a balanced supper. Do not choose more than 4.

____ Roast beef	____ Bread
____ Cake	____ Soup
____ Jelly	____ Milk
____ Peaches	____ Salad

14. Which food contains the most protein ? (Check one)

_____ Milk

_____ Carrots

_____ Juice

_____ Breakfast cereal

15. Check the line that lists <u>all four</u> food groups. (Check one)

____ Milk, cheese, bread, turkey

____ Grapes, carrot, bread, turkey

____ Milk, carrot, bread, turkey

____ Milk, eggs, bread, turkey

16. A serving of milk is (Check one)

____ a tablespoonful

____ an 8 ounce glass

____ half a cup

____ a 12 ounce glass

17. Check <u>everything</u> that is a mineral nutrient.

____ Iodine

____ Protein

____ Fat

____ Calcium

____ Energy

18. Check <u>everything</u> that is a full serving of food.

____ a slice of bread

____ a cookie

____ 2 - 3 ounces of meat

____ an orange

19. A calorie is

____ a vitamin.

____ a measure of food energy.

____ a serving of food.

____ a weight reducing food.

20. How many servings do you need each day from each food group?

Meat: _____ servings

Fruits and vegetables: _____ servings

Milk: _____ servings

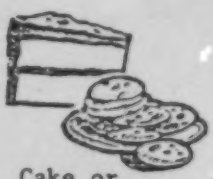
Bread and cereals: _____ servings

21. How often do you eat breakfast?

____ Every day
____ Usually everyday
____ Once in a while
____ Never

22. Did you eat breakfast today? ____ Yes ____ No

Check the food you had today for breakfast.

☐ Juice	☐ Eggs	☐ Milk or Cocoa	☐ Meat or Fish	☐ Sandwich
☐ Doughnut	☐ Cereal	 ☐ Cake or Cookies	☐ Kool-aid or Pop	☐ French toast, Waffles or Pancakes
☐ Bread, toast or muffins	☐ Jelly	☐ Peanut butter or Nuts	☐ Cheese	☐ Potato Chips
☐ Fruit	☐ Candy	☐ Soup	☐ Ice Cream	☐ Vegetables or Vegetable Salad

If there is no picture of what you ate for breakfast, write what you ate here: _____

_____

Next to each of the foods you have checked or written down, write the number of servings you had for breakfast.

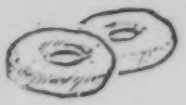
23. Did you eat lunch yesterday? ____ Yes ____ No

If yes: Where did you eat lunch?

____ at home or at a neighbor's

____ at school

Check the food you had yesterday for lunch.

☐ Juice	☐ Eggs	☐ Milk or Cocoa	☐ Meat or Fish	☐ Sandwich
 ☐ Doughnut	☐ Cereal	☐ Cake or Cookies	☐ Kool-aid or Pop	☐ French toast, Waffles or Pancakes
☐ Bread, toast or muffins	☐ Jelly	☐ Peanut butter or Nuts	☐ Cheese	☐ Potato Chips
☐ Fruit	☐ Candy	☐ Soup	☐ Ice Cream	☐ Vegetables or Vegetable Salad

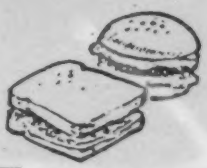
If there is no picture of what you ate for lunch, write what you ate here: _____

_____

Next to each of the foods you have checked or written down, write the number of servings that you had for lunch.

24. Did you eat supper last night? _____ Yes _____ No

Check the food you had last night for supper.

☐ Juice	☐ Eggs	☐ Milk or Cocoa	☐ Meat or Fish	 ☐ Sandwich
☐ Doughnut	☐ Cereal	☐ Cake or Cookies	☐ Kool-aid or Pop	☐ French toast, Waffles or Pancakes
☐ Bread, toast or muffins	☐ Jelly	☐ Peanut butter or Nuts	☐ Cheese	☐ Potato Chips
☐ Fruit	☐ Candy	☐ Soup	☐ Ice Cream	☐ Vegetables or Vegetable Salad

If there is no picture of what you ate for supper, write what you ate here: _____

_____

Next to each of the foods you have checked or written down, write the number of servings you had for supper.

25. Did you eat or drink anything between breakfast and lunch yesterday ?

____ Yes

____ No

If yes: What was it ? How much did you have ?

_____ _____

_____ _____

_____ _____

26. Did you eat or drink anything between lunch and supper yesterday, like an after school snack ?

____ Yes

____ No

If yes: What was it ? How much did you have ?

_____ _____

_____ _____

_____ _____

27. Did you eat or drink anything between supper and bedtime yesterday ?

____ Yes

____ No

If yes: What was it ? How much did you have ?

_____ _____

_____ _____

_____ _____

28. Do you ever help decide what your family is going to have for breakfast, lunch, or supper?

____ Yes

____ No

If yes: How often do you help decide?

____ Once in a while

____ Quite often

____ Almost all of the time

29. Have you tried a new food in the past week or so?

____ Yes

____ No

If yes: What was it? _____

30. Do you like to try new foods?

____ Yes ____ No

31. Do you have a television set at home?

____ Yes

____ No

If yes: Is it a color TV or black and white?

____ color TV

____ black and white TV

32. Would you say you watch television more or less than other people your age? (Check one)

____ More ____ Don't know

____ Less

____ About the same

33. A. About how much time, if any, do you spend watching television before going to school in the morning? (Circle the the right number)

0 1 2 3 4 or more hours other_____

B. About how much time do you spend watching TV on school afternoons before dinner? (Circle the right number)

0 1 2 3 4 5 6 7 8 9 hours other_____

C. How much time do you spend watching TV on school nights after dinner and before bedtime? (Circle the right number)

0 1 2 3 4 5 6 7 8 9 hours other_____

D. How about Saturdays? (Circle the right number)

0 1 2 3 4 5 6 7 8 9 10 hours other_____

APPENDIX C

POST-TEST QUESTIONNAIRE

NAME _____

SCHOOL _____

GRADE _____

TEACHER _____

FOOD,

MEALS

and

TV

1. Which one is a nutrient ? (Check one)

_____ Meat

_____ Energy

_____ Protein

2. True or false ?

A balanced diet is food from 3 food groups.

_____ True

_____ False

3. Fat is a nutrient that (check one)

_____ gives you energy.

_____ builds better teeth.

_____ helps build strong muscles.

4. True or false ?

Bread gives you about the same kind of nutrients as cereal.

_____ True

_____ False

5. True or false ?

The esophagus carries food from the mouth to the stomach .

_____ True

_____ False

6. The most important vitamin for healthy skin and good eyesight is (check one)

_____ Vitamin A

_____ Vitamin C

_____ Vitamin B

_____ Vitamin D

7. True or false ?

The best food group for protein is the fruits and vegetables group.

_____ True

_____ False

8. Pick the best breakfast. (Check cne)

____ Toast , cereal and sweet roll

____ Toast , peanut butter , milk and orange

____ Juice , oranges , apple and milk

9. Which one of these things does saliva do? (Check one)

____ Changes protein to vitamin.

____ Stops digestion.

____ Begins to change starch to sugar.

10. The most important mineral for building strong teeth and bones is (check one)

_____ Iron

_____ Calcium

_____ Iodine

_____ Magnesium

11, 12, 13

These questions are about meal planning. Write down foods and the number of servings of each that would make a balanced diet for a whole day.

Breakfast - -
Lunch - -
Supper - -

Before turning the page, make sure you have written the number of servings for each food.

14. Which food contains the most protein ? (Check one)

_____ Milk

_____ Carrots

_____ Juice

_____ Breakfast cereal

15. Check the line that lists <u>all four</u> food groups. (Check one)

____ Milk, cheese, bread, turkey

____ Grapes, carrot, bread, turkey

____ Milk, carrot, bread, turkey

____ Milk, eggs, bread, turkey

16. A serving of milk is (Check one)

____ a tablespoonful

____ an 8 ounce glass

____ half a cup

____ a 12 ounce glass

17. Check <u>everything</u> that is a mineral nutrient.

____ Iodine

____ Protein

____ Fat

____ Calcium

____ Energy

18. Check <u>everything</u> that is a full serving of food.

____ a slice of bread

____ a cookie

____ 2 - 3 ounces of meat

____ an orange

19. A calorie is

____ a vitamin.

____ a measure of food energy.

____ a serving of food.

____ a weight reducing food.

20. How many servings do you need each day from each food group?

Meat: _____ servings

Fruits and vegetables: _____ servings

Milk: _____ servings

Bread and cereals: _____ servings

21. How often do you eat breakfast?

____ Every day
____ Usually everyday
____ Once in a while
____ Never

22. Did you eat breakfast today? ____ Yes ____ No

Check the food you had today for breakfast.

☐ Juice	☐ Eggs	☐ Milk or Cocoa	☐ Meat or Fish	☐ Sandwich
☐ Doughnut	☐ Cereal	Cake or ☐ Cookies	Kool-aid ☐ or Pop	French toast, Waffles or ☐ Pancakes
Bread, toast ☐ or muffins	☐ Jelly	Peanut butter ☐ or Nuts	☐ Cheese	☐ Potato Chips
☐ Fruit	☐ Candy	☐ Soup	☐ Ice Cream	Vegetables or ☐ Vegetable Salad

If there is no picture of what you ate for breakfast, write what you ate here: _____

_____

Next to each of the foods you have checked or written down, write the number of servings you had for breakfast.

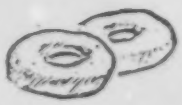
23. Did you eat lunch yesterday? ____ Yes ____ No

If yes: Where did you eat lunch?

____ at home or at a neighbor's

____ at school

Check the food you had yesterday for lunch.

☐ Juice	☐ Eggs	☐ Milk or Cocoa	☐ Meat or Fish	☐ Sandwich
 ☐ Doughnut	☐ Cereal	☐ Cake or Cookies	☐ Kool-aid or Pop	☐ French toast, Waffles or Pancakes
☐ Bread, toast or muffins	☐ Jelly	☐ Peanut butter or Nuts	☐ Cheese	☐ Potato Chips
☐ Fruit	☐ Candy	☐ Soup	☐ Ice Cream	☐ Vegetables or Vegetable Salad

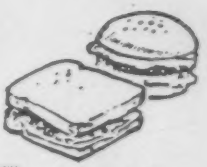
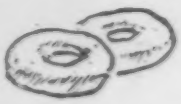
If there is no picture of what you ate for lunch, write what you ate here: _____

_____

Next to each of the foods you have checked or written down, write the number of servings that you had for lunch.

24. Did you eat supper last night? _____ Yes _____ No

Check the food you had last night for supper.

☐ Juice	☐ Eggs	☐ Milk or Cocoa	☐ Meat or Fish	 ☐ Sandwich
 ☐ Doughnut	☐ Cereal	☐ Cake or Cookies	☐ Kool-aid or Pop	☐ French toast, Waffles or Pancakes
☐ Bread, toast or muffins	☐ Jelly	☐ Peanut butter or Nuts	☐ Cheese	☐ Potato Chips
☐ Fruit	☐ Candy	☐ Soup	☐ Ice Cream	☐ Vegetables or Vegetable Salad

If there is no picture of what you ate for supper, write what you ate here: _____

_____

Next to each of the foods you have checked or written down, write the number of servings you had for supper.

25. Did you eat or drink anything between breakfast and lunch yesterday ?

____ Yes

____ No

If yes: What was it ? How much did you have ?

_____ _____

_____ _____

_____ _____

26. Did you eat or drink anything between lunch and supper yesterday, like an after school snack ?

____ Yes

____ No

If yes: What was it ? How much did you have ?

_____ _____

_____ _____

_____ _____

27. Did you eat or drink anything between supper and bedtime yesterday ?

____ Yes

____ No

If yes: What was it ? How much did you have ?

_____ _____

_____ _____

_____ _____

28. Do you ever help decide what your family is going to have for breakfast, lunch, or supper?

____ Yes

____ No

If yes: How often do you help decide?

____ Once in a while

____ Quite often

____ Almost all of the time

29. Have you tried a new food in the past week or so?

____ Yes

____ No

If yes: What was it? _____

30. Do you like to try new foods?

____ Yes

____ No

31. Did you watch any of the Mulligan Stew TV shows?

____ Yes

____ No

If yes: check all the shows you watched.

____1. "The Great Nutrition Turn On" about the sleepy town.

____2. "Look Inside Yourself" about Bobby and Alice, the teen-age brother and sister, who were tired and cranky all the time.

____3. "The Flim-Flam Man" who told the Mulligan Stew gang that they should buy his book on quick and fad diets.

____4. "Getting it All Together" about foods from other countries.

____5. "Count Down 4-4-3-2" about Wilbur Dooright's camping trip.

____6. "The Racer That Lost His Edge" about the fat race car driver.

32. When did you watch? (You may check more than one)

____ Saturday morning at 8:00 in the morning

____ Thursday at 6:30 at night

____ morning at school

____ afternoon at school

____ other

Circle the time you watched most.

33. Did you usually watch it alone or with someone else? (Check one)

____ alone

____ with someone else

34. How did you decide to watch the show or shows? (Check as many as are right)

____ It was a school assignment.

____ My mother or father wanted me to watch them.

____ My brother or sister wanted to watch.

____ I wanted to watch.

35. Were there any times you wanted to watch Mulligan Stew but couldn't because someone wanted to watch something else?

____ Yes

____ No

36. Would you say the Mulligan Stew shows were (Check one)

____ More interesting

____ Less interesting, or

____ About as interesting as other TV programs you usually watch ?

37. Did any of the Mulligan Stew gang do things that you like to do, yourself ?

____ Yes

____ No

38. Did any of the Mulligan Stew gang do things that you would definitely not like to do ?

____ Yes

____ No

39. Did most of the Mulligan Stew gang wear the kind of clothes that you like to wear ?

____ Yes

____ No

40. How about hair styles -- did most of the Mulligan Stew gang have hair styles like young people you know, or not ?

____ Yes

____ No

41. Do you think your closest friend would (Check one)

____ like

____ not like the Mulligan Stew TV shows?

42. Did most of the Mulligan Stew gang talk the way you and your friends do?

____ Yes

____ No

43. Did any of the Mulligan Stew gang remind you of someone you know?

____ Yes

____ No

44. Have you talked about the Mulligan Stew TV shows with any of your friends?

____ Yes

____ No

45. Do you feel the Mulligan Stew TV shows would make young people (Check one)

____ like 4-H better

____ like 4-H less, or

____ would not make any difference how young people feel about 4-H?

46. Do you remember seeing any schools or school playgrounds in the Mulligan Stew shows?

____ Yes

____ No

If yes: Did the schools or school playgrounds make the shows

____ more interesting

____ less interesting, or

____ didn't they matter?

47. Do you remember seeing any government workers in the Mulligan Stew shows, like policemen or astronauts?

____ Yes

____ No

If yes: Did these government workers make the shows

____ more interesting,

____ less interesting, or

____ didn't they matter?

48. Do you remember seeing any baseball players in the Mulligan Stew shows?

____ Yes

____ No

If yes: Did these baseball players make the shows

____ more interesting,

____ less interesting, or

____ didn't they matter?

49. How about Wilbur Dooright -- did he make the shows

____ more interesting

____ less interesting, or

____ didn't he matter?

50. Were the Mulligan Stew gang: (Check one of each pair)

____ boring	or	____ not boring
____ interesting	or	____ not interesting
____ believable	or	____ not believable
____ cool	or	____ square
____ honest	or	____ not honest
____ natural	or	____ not natural
____ pleasant to each other	or	____ not pleasant to each other
____ funny	or	____ not funny
____ serious	or	____ not serious
____ fast	or	____ slow
____ doing important things	or	____ not doing important things
____ fair to each other	or	____ not fair to each other
____ fair to Wilbur Dooright	or	____ not fair to Wilbur Dooright

5i. Write down the name of one TV show or program that you watch a lot. _____

Rate the people, or characters in that show or program. Are they

____	boring	or	____	not boring
____	interesting	or	____	not interesting
____	believable	or	____	not believable
____	cool	or	____	square
____	honest	or	____	not honest
____	natural	or	____	not natural
____	pleasant to each other	or	____	not pleasant to each other
____	funny	or	____	not funny
____	serious	or	____	not serious
____	fast	or	____	slow
____	doing important things	or	____	not doing important things
____	fair to each other	or	____	not fair to each other

52. What is your age? _____ years

53. Are you a 4-H member? ____ Yes ____ No

54. Are you a ____ boy ____ girl

55. Do you have any brothers or sisters living at home?

____ Yes

____ No

If yes: how many? _____

APPENDIX D

SPECIALISTS QUESTIONNAIRES

TEACHERS: Items 1-20
NUTRITIONISTS: Items 1-18
4-H INFORMATION SPECIALISTS AND
TV STATION REPRESENTATIVES: Items 1, 3-18, 21

MULLIGAN STEW EVALUATION

These are questions which we are asking a number of persons in education, research, and broadcasting, about the Mulligan Stew Television Series.

1. Did you happen to watch any of the Mulligan Stew TV shows?

_____Yes
_____No

If "No", skip to question 10 on page 10

If Yes Which of the shows did you watch?

_____1. "The Great Nutrition Turn On" about the sleepy town.

_____2. "Look Inside Yourself" about Bobby and Alice, the teen-age brother and sister, who were tired and cranky all the time.

_____3. "The Flim-Flam Man" who told the Mulligan Stew gang that they should buy his book on quick and fad diets.

_____4. "Getting It All Together" about foods from other countries.

_____5. "Count Down 4-4-3-2" about Wilbur Dooright's camping trip.

_____6. "The Racer That Lost His Edge" about the fat race car driver.

2. Please rate the Mulligan Stew TV series' coverage of the following topics, keeping in mind the average age of the viewer (9 to 11 years).

a. THE 4-4-3-2 BALANCED DIET CONCEPT

Accuracy
_____mostly accurate _____not sure
_____some accurate, some inaccurate
_____mostly inaccurate

If "some" or "mostly inaccurate", please explain.

_____

_____

_____

Understandability for 9 to 11-year-old audience
_____generally understandable _____not sure
_____generally not understandable

If "generally not understandable", please explain.

_____

_____

_____

b. IMPORTANCE AND FUNCTION OF DIFFERENT NUTRIENTS

Accuracy
_____mostly accurate _____not sure
_____some accurate, some inaccurate
_____mostly inaccurate

If "some" or "mostly inaccurate", please explain.

_____

_____

_____

Understandability for 9 to 11-year-old audience
_____generally understandable _____not sure
_____generally not understandable

If "generally not understandable", please explain.

_____

_____

_____

c. THE DIGESTION PROCESS

Accuracy
_____mostly accurate _____not sure
_____some accurate, some inaccurate
_____mostly inaccurate

If "some" or "mostly inaccurate", please explain.

_____

_____

_____

Understandability for 9 to 11-year-old audience
_____generally understandable _____not sure
_____generally not understandable

If "generally not understandable", please explain.

_____

_____

_____

d. SIMILARITIES AND DIFFERENCES AMONG PEOPLE WHICH INFLUENCE FOOD HABITS

Accuracy
_____mostly accurate _____not sure
_____some accurate, some inaccurate
_____mostly inaccurate

If "some" or "mostly inaccurate", please explain.

_____

_____

_____

e. INTERACTION AMONG DIFFERENT PEOPLE IN FOOD EXPERIENCES

Accuracy
_____mostly accurate _____not sure
_____some accurate, some inaccurate
_____mostly inaccurate

If "some" or "mostly inaccurate", please explain.

_____

_____

_____

f. INTERRELATIONSHIPS AMONG PEERS

Accuracy

_____mostly accurate
_____some accurate, some inaccurate
_____mostly inaccurate
_____not sure

If "some" or "mostly inaccurate", please explain.

_____

_____

_____

3. Following are 5 Principles which are stated in the Mulligan Stew TV series.

a. Please estimate, for each one, whether you think the TV show content would lead to low, medium, or high recall of that principle.

PRINCIPLE	ESTIMATED RECALL BY 9 to 11-year-olds		
	LOW	MEDIUM	HIGH
A balanced diet contains 4 servings of bread or cereal, 4 of fruits or vegetables, 3 of milk and 2 of meat.	_____	_____	_____
Carbohydrates and fats are nutrients that give you energy.	_____	_____	_____
The most important vitamin for building strong teeth, bones and muscles is vitamin D.	_____	_____	_____
A serving of milk is an 8 ounce glass.	_____	_____	_____
Iron and Iodine are mineral nutrients.	_____	_____	_____

b. Next, would you please rank these 5 principles according to how well you believe they would be learned by 9 to 11-year-old viewers.

PRINCIPLES	RANK (1 is highest learning, 5 is lowest)
A balanced diet contains 4 servings of bread or cereal, 4 of fruits or vegetables, 3 of milk and 2 of meat.	_____
Carbohydrates and fats are nutrients that give you energy.	_____
The most important vitamin for building strong teeth, bones and muscles is vitamin D.	_____
A serving of milk is an 8 ounce glass.	_____
Iron and iodine are mineral nutrients.	_____

4. Please indicate how appropriate you feel the ~~film~~ TV series was for representing the following:

a. 4-H

_____generally appropriate _____not sure
_____generally inappropriate

If "generally inappropriate", please explain.

_____

_____

_____

b. Agricultural Extension Service

_____generally appropriate _____not sure
_____generally inappropriate

If "generally inappropriate", please explain.

_____

_____

_____

c. Persons involved in Nutrition Education

_____generally appropriate _____not sure
_____generally inappropriate

If "generally inappropriate", please explain.

_____

_____

_____

d. Persons involved in Nutrition Research

_____generally appropriate _____not sure
_____generally inappropriate

If "generally inappropriate", please explain.

_____

_____

_____

5. Following are some questions of the type that often confront specialists and teachers who are consulted about educational films.

5a. As you recall, what seemed to be the main point of the series?

_____

_____

_____

_____

_____

_____

5b. Here is a list of the educational objectives of the Mulligan Stew TV series. How effective do you think the series was in achieving each of these objectives among 9 to 11-year-olds (put your rating on the line with an 'x").

1. Acquire and apply nutrition knowledge helpful in becoming healthful, productive individuals.

Highly effective ——— Highly ineffective

2. Gain personal satisfaction through developing curiosity and awareness about information presented.

Highly effective ——— Highly ineffective

3. Accept themselves and others through recognizing similarities and differences which influence food habits.

Highly effective ——— Highly ineffective

4. Learn more about family members through interactions when participating in food experiences.

Highly effective ——— Highly ineffective

5. Recognize importance of relating to peers.

Highly effective ——— Highly ineffective

6. Would you say the Mulligan Stew series is more interesting, less interesting, or about as interesting to 9 to 11-year-olds as other TV programs which they watch? Please check one.

_____more interesting
_____less interesting
_____about as interesting to 9 to 11-year-olds as other TV programs they watch
_____not sure

7. In your estimation, did any of the kids in the Mulligan Stew gang do things that 9 to 11-year-olds like to do themselves?

_____Yes
_____No
_____not sure

8. In your estimation, did any of the Mulligan Stew gang do things that 9 to 11-year-olds would definitely not like to do?

_____Yes _____Not sure
_____No

If Yes What were these things? _____

_____

9. As far as you can tell, did most of the Mulligan Stew gang wear the kinds of clothes that young people like to wear these days?

_____Yes _____Not sure
_____No

10. How about hair styles--did most of the Mulligan Stew gang have hair styles like young people have these days?

_____Yes _____Not sure
_____No

11. In your estimation, would 9 to 11-year-olds expect their closest friends to

_____like, or _____Not sure
_____not like the Mulligan Stew TV series?

12. Did most of the Mulligan Stew gang talk the way most 9 to 11-year-olds do these days?

_____Yes _____Not sure
_____No

13. Would you expect 9 to 11-year-old viewers to see persons in the Mulligan Stew gang who might remind them of someone they know, or not?

_____Yes _____Not sure
_____No

14. Would you expect 9 to 11-year-old viewers of the Mulligan Stew TV shows to talk about the programs with their friends?

_____Yes _____Not sure
_____No

15. Do you feel the Mulligan Stew TV shows would make young people

_____like 4-H better,
_____like 4-H less, or
_____wouldn't it make any difference in how young people feel about 4-H?

16. As you may recall, the Mulligan Stew series included scenes of schools and playgrounds, government workers like policemen and astronauts, baseball players, and an adult named Wilbur Dooright.

Let's consider those actors individually. In your estimation,

would the schools and playgrounds make the series
_____more interesting, or
_____less interesting to 9 to 11-year-old viewers?
_____or wouldn't they matter?

would the government workers, like policemen and astronauts make the series
_____more interesting, or
_____less interesting to 9 to 11-year-old viewers?
_____or wouldn't they matter?

would the baseball players make the series
_____more interesting, or
_____less interesting to 9 to 11-year-old viewers?
_____or wouldn't they matter?

how about Wilbur Dooright--would he make the program
_____more interesting, or
_____less interesting to 9 to 11-year-old viewers?
_____or wouldn't he matter?

17. Now, regarding the Mulligan Stew gang members, would you expect 9 to 11-year-old viewers to consider them

_____boring	or	_____not boring
_____interesting	or	_____not interesting
_____believable	or	_____not believable
_____cool	or	_____square
_____honest	or	_____not honest
_____natural	or	_____not natural
_____pleasant to each other	or	_____not pleasant to each other
_____funny	or	_____not funny
_____serious	or	_____not serious
_____doing important things	or	_____not doing important things
_____fair to each other	or	_____not fair to each other
_____fair to Wilbur Dooright	or	_____not fair to Wilbur Dooright

18. Please give us any additional comments you would like to make about the 'Mulligan Stew TV series.

_____

_____

_____

_____

_____

19. Have these children received any instruction on foods and nutrition in school since the pre-test, either from you or from another teacher?

_____Yes
_____No
_____Don't know

If Yes

19a. Did you use any of the Mulligan Stew project materials?

_____Yes
_____No [If no, skip to 19b on page 12]
[If yes, answer the following:]

19a-1. Did you hand out the comic book?

_____Yes
_____No

If Yes Did you ask the students to
_____read them on their own
_____read them in class
_____both

19a-2. Did you use

_____both the song records and the song books
_____the records, not the books, or
_____the books, not the records, or
_____neither

19a-3. Listed below are activities listed in the yellow guide book for teachers and/or in the comic book.

Please check the exercises, if any, which were done in your class.

_____ Comic book Fill-in-the-blank exercise
_____ "My Own 4-4-3-2 Weekly Food Chart"
_____ No-Bake Cookies
_____ "Digestion Drag Track"
_____ Bread experiment
_____ "Pat-a-Pizza" (making 10 little pizzas)
_____ Dried Foods Experiments
_____ Mulligan Stew
_____ "Nutrition Word Scramble"
_____ "Nutrition Bee" game
_____ "Nutrition Mission"
_____ Breakfast Poster cut-outs
_____ Shadow Poster
_____ Quick Breakfast (planned by students)
_____ "Change Starch to Sugar" (student chews crackers)
_____ Food additive puzzle
_____ "Fight Fad Diets . . . An Assignment from Upstairs"
_____ Mulligan Stew cutout.
_____ A visit by a foreign guest
_____ "Foods of your state" poster
_____ A state lunch or picnic
_____ "Puppet show for little tots"
_____ "Taste-in" for orange juice and orange drinks
_____ "Restore dry foods"
_____ "Plan a space flight meal"
_____ Field trip to a cafeteria
_____ "Snack time" comparison of snack trays
_____ "Make-Believe" cafeteria
_____ "Plan a Low-Cost Menu"
_____ Field trip to a food store
_____ Calorie exercise

19a-4. Did you use any of the discussion questions in the yellow guidebook?

____Yes
____No

[If Yes] Did you use

____some,
____most, or
____all of these
discussion questions?

19b. What other materials did you use, if any?

_____

_____

_____

_____

19c. How did you use these other materials? (Describe briefly)

_____

_____

_____

What topics were covered? _____

_____

_____

19d. About how many different days did this instruction on foods and nutrition cover?

_____days

19e. About how much time was spent on this instruction each day when it was held?

_____(minutes or hours)

19f. Below are four things from the Mulligan Stew project materials. In your judgment and experience, how would you rate each one in terms of its usefulness for teaching?

	Very Useful	Somewhat Useful	Not Useful	DK	Haven't Seen
Comic Book	_____	_____	_____	_____	_____
Song Records	_____	_____	_____	_____	_____
Song Books	_____	_____	_____	_____	_____
Nutrition exercises such as No-Bake Cookies and "Mulligan Stew" recipe	_____	_____	_____	_____	_____

20. Did you remind the children in your class(es) of the times the Mulligan Stew TV shows would be shown for home viewing?

____Yes
____No

If Yes — How many times were the home viewing times mentioned in class for each show?

____1. "The Great Nutrition Turn On" about the sleepy town.

____2. "Look Inside Yourself" about Bobby and Alice, the teen-age brother and sister, who were tired and cranky all the time.

____3. "The Flim-Flam Man" who told the Mulligan Stew gang that they should buy his book on quick and fad diets.

____4. "Getting It All Together" about foods from other countries.

____5. "Count Down 4-4-3-2" about Wilbur Dooright's camping trip.

____6. "The Racer That Lost His Edge" about the fat race car driver.

21. Compared with all the educational TV programs you have seen or broadcast in recent years, how would you rate the Mulligan Stew TV series?

_____ One of the best

_____ Well above average

_____ Slightly above average

_____ About average

_____ Slightly below average

_____ Well below average

_____ One of the worst